FaderMaster

MIDI COMMAND CONTROLLER
Owners Manual
Second Edition July 1989

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13478 Beach Avenue, Marina Del Rey, California 90202

JL COOPER ELECTRONICS

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Greetings

Thank you for purchasing J.L.Cooper's FaderMaster, the MIDI Command Controller. You've probably noticed a trend in recent years for music manufacturers to remove knobs and sliders from their equipment to cut down costs. Ironically, this trend has paralleled the development of increasingly sophisticated products. Never before have we had access to products with so many features, but with so little control.

J.L.Cooper reverses that trend by bringing you back into control. The FaderMaster provides quick, continuous remote control for various parameters of all kinds of MIDI devices.

Used in conjunction with a sequencer, FaderMaster is an invaluable aid to mixing volume. Reverbs, delays, tone generators, virtually anything with a MIDI input can be remotely controlled with FaderMaster. FaderMaster's MIDI note and clock delay allows the addition of real-time "feel" to drum machines used in conjunction with sequencers.

All these features have been combined to put you back in control, and give you new opportunities for creative freedom, in the studio or on-stage.

With the optional FaderMaster Disk, FaderMaster's setups may be displayed, programmed, and edited "off-line" on computer. The program is presently available for the Apple Macintosh and the Atari ST computers.

Please fill out the enclosed warranty card and mail it in soon, so we can keep you informed of any software updates as they become available.

FaderMaster Owner's Manual

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Chapter 1 Features

This chapter presents you with a comprehensive list of FaderMaster's features, to help you realize its potential uses. If you have an application already in mind, this may suggest alternative applications that you may not have considered.

Memory
FaderMaster's program memory is organized into three banks, called User, Factory, and Sysex Banks. There are 9 programs in the User Bank, 30 programs in the Factory Bank (that is, 30 "presets"), and 1 Programmable System Exclusive Bank.

User Bank
In this bank, each fader may be individually programmed to send these MIDI Messages:

a) **Note ON/OFF** (Used on certain MIDI-controlled effects or amplifiers. Can also be used for firing a drum sound. Any Note number may be programmed.)
b) **Continuous Controller** (Used for volume, modulation, etc. Any Controller number may be programmed.)
c) **Program Change** (For remote preset selection.)
d) **Channel After Touch** (For expression control.)
e) **Pitch Bend** (For expression and transposition.)
f) **Non-Registered Controllers.** (Used for various purposes depending on receiving instrument.)

In addition, each fader may be individually set to the following "attributes":

a) **Grouping**: Any fader may be grouped to any other fader.
b) **Speed**: A fader may be scanned from 6 to 100 times/sec. The speed (or "scan rate") indicates how often the FaderMaster's internal computer "looks" at the fader to see if it has been moved. Generally speaking, the higher the speed, the more responsive the fader.
c) **Maximum** Value: The highest MIDI numerical value the fader will send.
d) **Minimum** Value: The lowest MIDI numerical value the fader will send. If this value is set to exceed Maximum value, fader will act in "reverse" by sending decreasing MIDI values as the fader is moved up.
e) **Merge** Status (for Note or Continuous Controller data): Normally, MIDI data received by FaderMaster is "merged" with fader commands. Individual faders may be set to one of three different Merge modes to control when MIDI data is *merged with* or *replaced by* data sent when a fader is moved. This function is useful for re-recording volume data on a sequencer.

f) **Delay**: Alternately, faders 1 thru 7 may be set to delay MIDI Note or Continuous Controller data passing through FaderMaster. Fader 8 can be set to delay MIDI Clock data. The delay time is controlled by the position of the fader over a range from 0 to 15 milliseconds. Varying the delay interval by sliding the faders in real time can impart a more "human feel" to an otherwise mechanistic percussion track.

After you have assigned each individual fader to a MIDI command, and set the "attributes" for each fader, this setup becomes one program in the User Bank. Remember, you have nine user-assignable programs in this bank. These are stored in FaderMaster's lithium battery-backed memory.

Null

The Null feature operates on any fader assigned to send Note or Controller commands. Null allows "seamless" editing of volume information when MIDI mixing on a sequencer. Suppose that in the User bank a fader has been set for Note or Continuous Controller commands. FaderMaster can monitor incoming MIDI messages and display the *difference* between the position of a fader and the last Note or Controller value received for that fader. Combined with the merge function, the NULL feature permits re-recording MIDI volume data from the middle of a sequence (i.e. "punching in") without any jumps in level.

Factory Bank

The Factory Bank consists of thirty presets. These have been programmed to allow FaderMaster to function as a remote controller for specific effects devices and instruments. (See Appendix A for a list of instruments). These presets are stored in FaderMaster's internal EPROM, and not user-changeable except that certain instruments may also include a channel number as part of a Sysex message. Then the user may select a channel number individually for each program in the Factory Bank. These changes will be saved in the battery-backed memory.

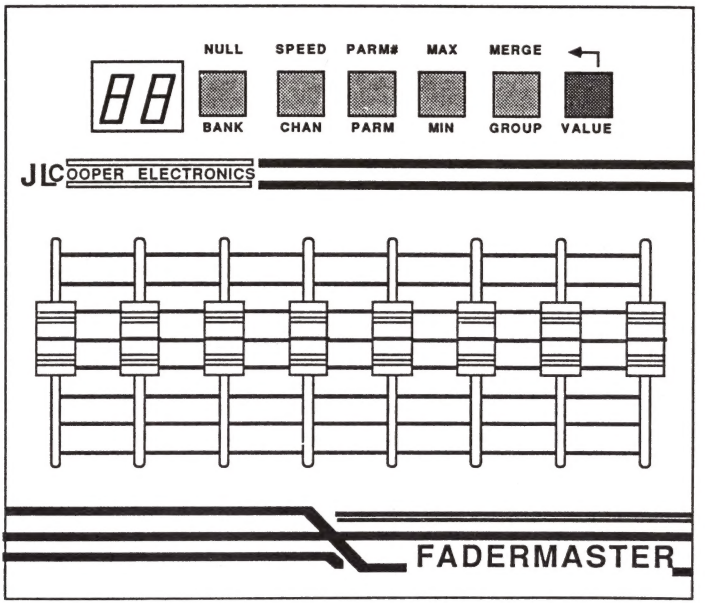
Programmable Sysex Bank

By using either a J.L.Cooper optional software package, or a user-written program, it is possible to load a set of Sysex header data into this bank. Once this is done, the user may then program a "Parameter Number", Speed, Minimum and Maximum values, as with the User Bank above.

Two additional features operate on all three banks:

Value
It is possible to view the MIDI value of the last fader moved, and to reposition a fader without sending out any data.

Snapshot
FaderMaster can send out a "snapshot" burst of MIDI messages corresponding to the current position of all the faders, without having to actually move any of the faders. This may be used for setting up initial mix levels at beginning of sequence. Or, as another example, the faders could be set to eight different program change commands on different MIDI channels. Using the Snapshot function it would then be possible to send these program changes into your MIDI system to setup the sound of, say, a multi-timbral tone generator.



Chapter 2 Front Panel Controls

Each button has two functions, normal and shifted. The **VAL** (value) button doubles as a shift key. The labels below the buttons designate their normal function. While **VAL** is held down, the labels above the button apply.

When **VAL** is pressed by itself, you can move a fader without sending data, and view the value that would have been sent.

BANK: When pressed, the program number is advanced by one.
The LED display normally shows the present bank and program.
The progression is U1 through U9 (for the programs is the User Bank), then P1 (for the Programmable Sysex Bank), then F1 through F9 (for the Factory Presets Bank, and then 10 through 30 (the rest of the Factory presets.)

To decrement the bank/program number by one, hold CHAN and press BANK.

As a short cut, you can hold down the BANK button and move any fader to quickly go to a desired program. No data is sent while moving the fader.

CHAN: When pressed, the MIDI Channel assignment for the last fader moved is shown in the LED display. The MIDI Channel will be a number from 1 to 16.

If any fader is moved while the CHAN button is down, that fader's MIDI Channel assignment will be changed and shown in the LED display. The channel shown when the button is released will be stored in memory for that specific fader and program.

PARM: (Parameter) The type of MIDI message that a fader is setup to send is called a Parameter. When pressed, the Parameter assignment for the last fader moved is shown in the LED display. The Parameter assignments are:

No = Note ON/OFF pair
Co = Continuous Controller
PG = Program Change
AF = Channel After Touch
Pb = Pitch Bend
NC = Non Registered Controller

As with the CHAN button above, you may hold down the **PARM** button and move a fader to view and change that fader's Parameter assignment.

MIN: When pressed, the Minimum value for the last fader moved is shown in the LED display. This will be a value from 00 to 127. (Values above 99 will be shown flashing, with a "1" alternating with the lowest two digits.)

As above, you may hold down the **MIN** button and move a fader to view and change that fader's Minimum value.

GROUP: When pressed, the Group assignment for the last fader moved may be displayed and changed.

Shifted Functions: Press **VAL** first, holding it down while selecting the shifted function.

NULL: If VAL and BANK are pressed, the **NULL** function is called into operation. The number shown in the display will equal the difference between position of a fader and last Note or Controller data received for that fader.

SPEED: If VAL and CHAN are pressed, the **SPEED** of a fader may be displayed and changed. The number "01" indicates the fastest scan rate (100 per second), while the number "16" indicates the slowest rate (6.25 per second.)
PARM#: If VAL and PARM are pressed, the **PARM#** (Parameter Number) may be selected for the last fader moved. This will be a **MIDI Note Number**, **Continuous Controller Number**, or a **Non Registered Controller Number,** depending on the parameter assignment for that fader. PARM# does not apply to faders setup to send Program Change, After Touch, or Pitch Bend commands. (Values above 99 will be shown flashing, with a "1" alternating with the lowest two digits.)

When in the P1, this button allows the individual Parameter Number to be set for each fader.

MAX: If VAL and MIN are pressed, the Maximum value for the last fader moved is shown in the LED display. This will be a value from 00 to 127. (Values above 99 will be shown flashing, with a "1" alternating with the lowest two digits.)

As usual, you may hold down the **MAX** button and move a fader to view and change that fader's Maximum value.

When the Maximum value is set to a number less than the Minimum value, the fader will operate reversed. (By combining this with the Group function, a cross fade function is achieved. This will be discussed in Chapter 4.)

MERGE If VAL and GROUP are pressed, the Merge Status may be displayed and changed for any fader assigned to send Note or Continuous Controller commands. MERGE is also used to select a Delay Mode.

oN = Merge on
oF = Merge off
Co = Merge conditional.
dL = Delay Mode

SNAPSHOT: If MIN, GROUP, and VAL are simultaneously depressed, FaderMaster will send out a burst of MIDI messages corresponding to the current values of each fader.

INITIALIZE: If BANK, CHAN, and PARM are simultaneously depressed while turning the unit on, all User Banks will be cleared and reloaded with the following default setting: Faders 1 through 8 are set to send MIDI Continuous Controller commands. In U1, faders are assigned to controller numbers 0 through 7. In U2, faders are assigned to controller numbers 8 through 15, etc. All faders set to MIDI channel 1, with maximum scan speed, full range, merge on, and no grouping. Programmable Sysex Bank (P1) is loaded with data to control the ART MultiVerb™.

Chapter 3 Hookup Diagrams

As you might expect, your application for FaderMaster will determine how you hook up your MIDI cables. Refer to illustrations.

(1) **Universal remote controller:** Simply hook up a MIDI cable from the output of FaderMaster to the input of the device you wish to control. This will typically be an audio effects device or a tone generator.

(2) **Remote control of more than one device:** Use the "thru" of the first device.

(3) **Mixing with a sequencer:** Hook up a MIDI cable from the output of FaderMaster to the input of the sequencer. Usually, the MIDI out of the sequencer feeds a thru box which in turn drives your MIDI instruments. Send one output of that thru box back to the input of FaderMaster. Since FaderMaster passes data from its input to its output, it is important that you set your sequencer to "echo off" to avoid creating a MIDI loop.

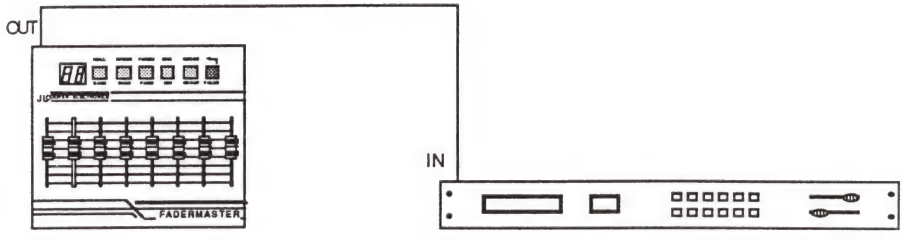
(4) **Remote Level Control:** Send MIDI data from FaderMaster via a MIDI Switch Box or Thru Box to all keyboards or tone generators that can receive volume change commands.

(5) **Expression controller:** To allow FaderMaster to "inject" additional MIDI messages into the data stream from your keyboard controller, hook up a MIDI cable from the output of your keyboard controller to the input of FaderMaster. The output of FaderMaster then goes to either a slaved tone generator, or else into a sequencer to record the "enhanced" keyboard data.

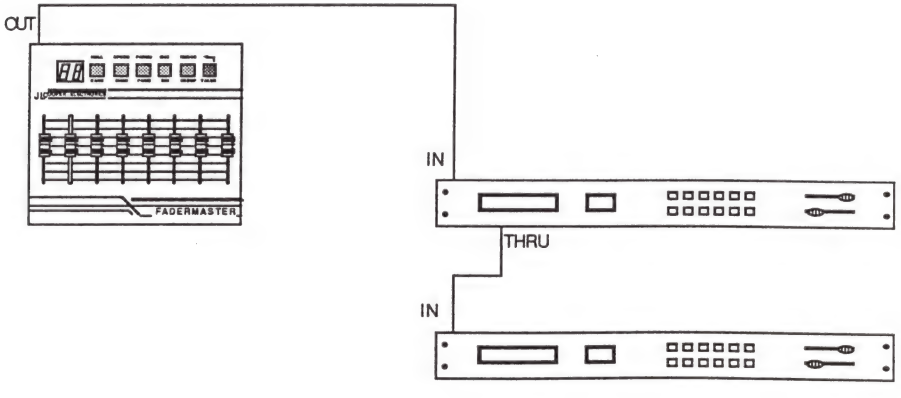
(6) **Human feel:** Generally, there are two ways to use a drum machine with a sequencer. One is to use the drum machine as a slave tone generator. The actual drum tracks in this case reside on the sequencer. Each of the first seven faders on FaderMaster can be set to delay drum notes in real time.

Alternately, the drum machine is set to slave to external MIDI clocks coming from a sequencer or synchronizer. The drum tracks in this case reside in the drum machine, as a series of patterns chained into a "song". Fader number eight on FaderMaster can be set to delay MIDI clocks in real time.

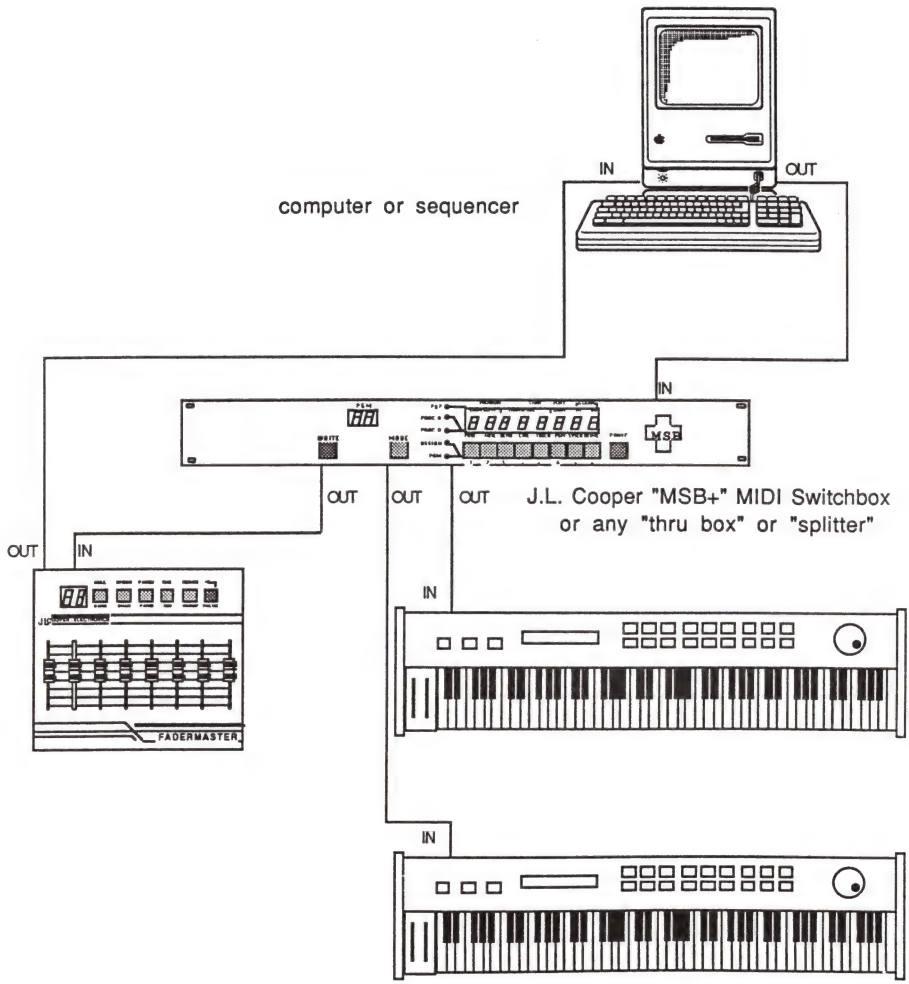
In either case, FaderMaster is placed in the MIDI data stream between the sequencer (or synchronizer) and the drum machine. Hook up a MIDI cable from the output of the sequencer (or synchronizer) to the input of FaderMaster. Hook up a MIDI cable from the output of FaderMaster to the input of the drum machine.



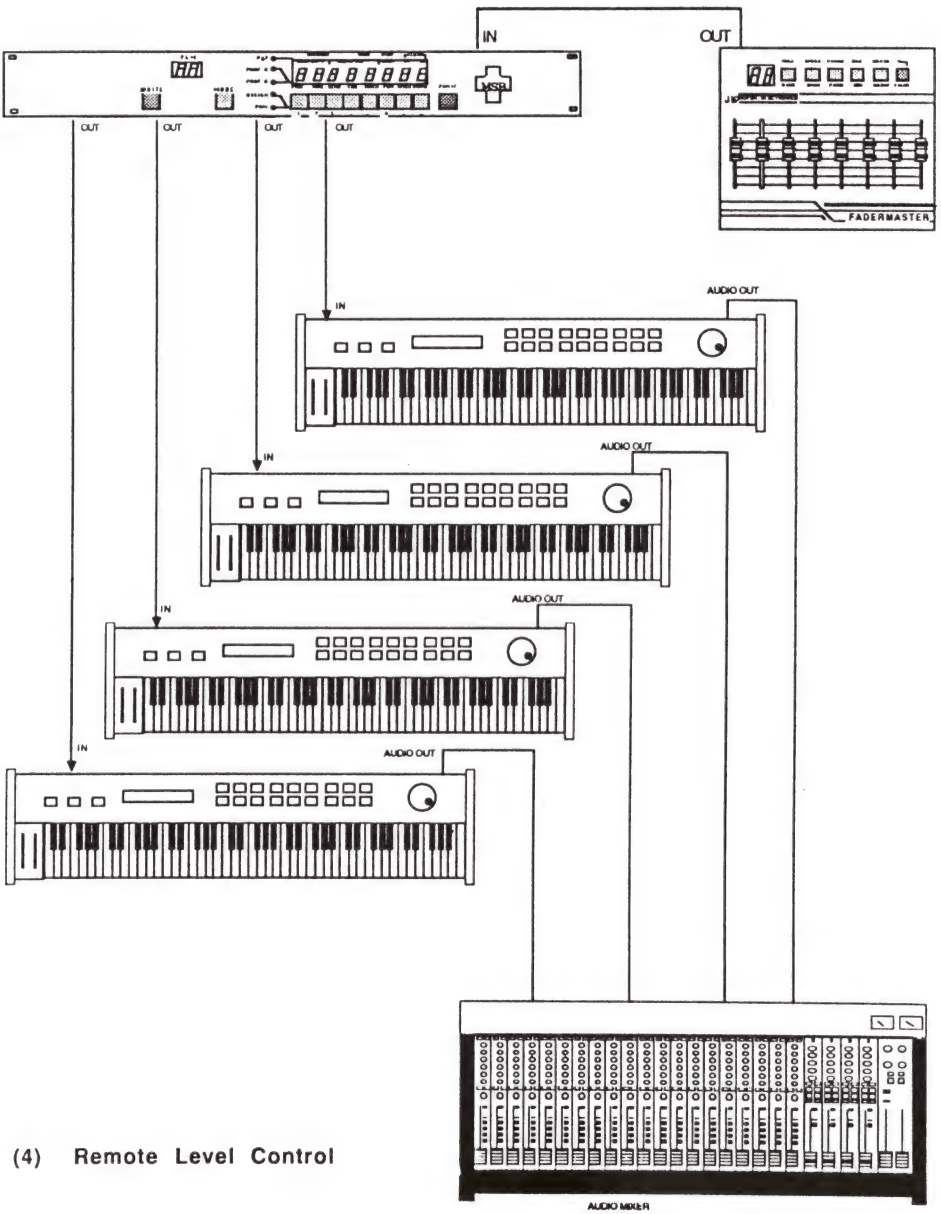
(1) Universal remote controller



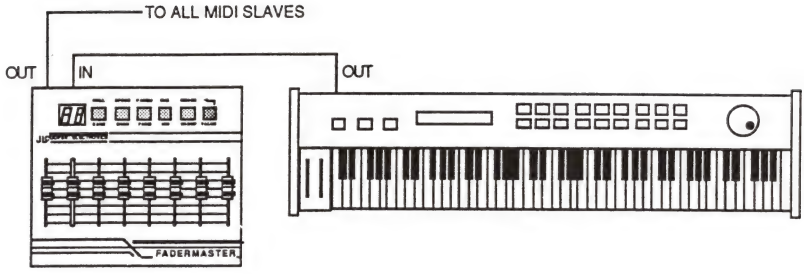
(2) Remote controlling more than one device



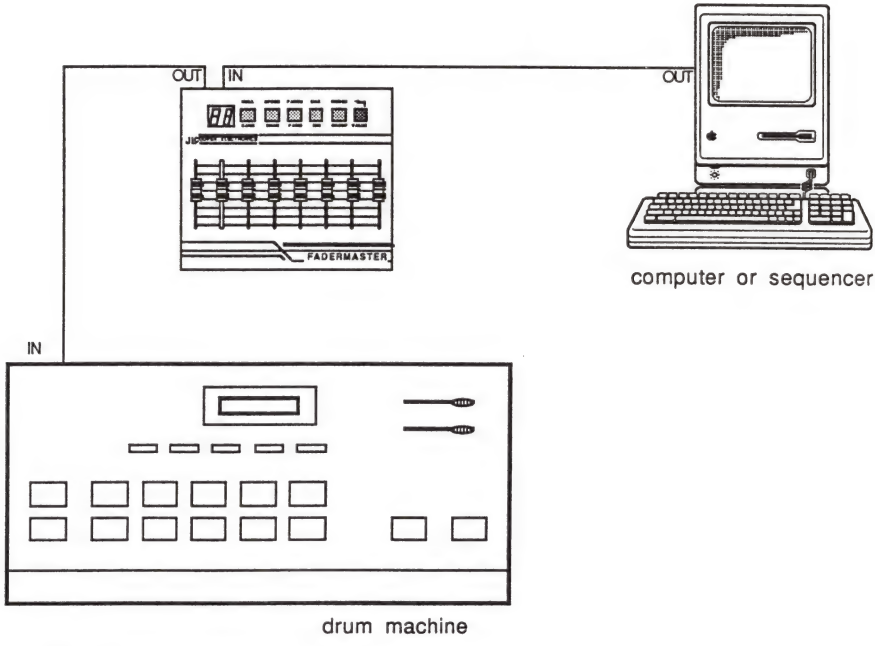
(3) Mixing with a sequencer



(4) Remote Level Control

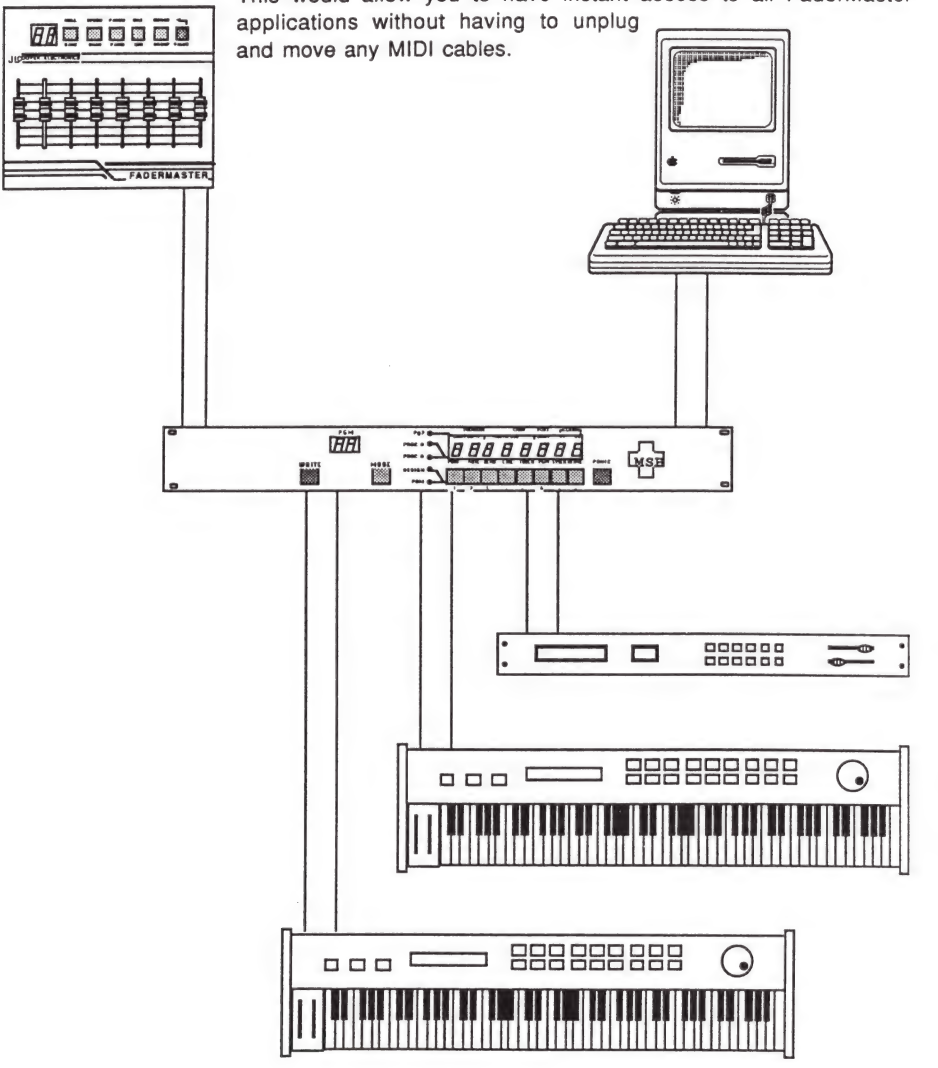


(5) Expression Controller



(6) Human Feel

(7) **All of the above:** The most powerful way to incorporate FaderMaster into your MIDI system is to patch it in and out of a MIDI switchbox, such as the J.L.Cooper MSB+. This would allow you to have instant access to all FaderMaster applications without having to unplug and move any MIDI cables.



(7) Full MIDI Studio Control

Chapter 4 User Bank

This bank is typically used for sequencer mixing, timing applications, and remote control for any device not included in the factory preset bank. If you intend to use FaderMaster facilitate sequencer mixing, be sure that you are thoroughly familiar with the operation of your sequencer first.

*Please Note: The **Factory Bank** may also be used for certain level control applications. Several presets have been designed for this purpose to save you programming time and "free up" some programs in the User Bank. After reading this chapter, you may want to look in Appendix A to see if you can make use of these presets.*

Selecting User Bank

The nine programs in the user bank are designated **U1** through **U9**. FaderMaster normally powers up in **U1**. Pressing the BANK button advances the program number by one. (Holding CHAN and pressing BANK decrements the program number by one.) While holding the BANK button you may rapidly go to the desired program by moving any fader.

Assigning Faders

Creating your own programs in the User Bank is a simple process. First select a function button, then slide the fader you wish to assign. Stop moving the fader when the desired function or value is shown in the display. These fader assignments are automatically saved in memory to the presently selected User bank.

Example: Basic Sequencer Mixing or Remote Level Control
Most synthesizers (but not all) respond to MIDI Volume commands. In the MIDI Spec, this command is also called "Continuous Controller number seven". You will need to assign all eight faders to controller number 7, and then assign each to a different MIDI channel. The MIDI channel number corresponds to the receiving channel of the instrument to be controlled. The MIDI output of FaderMaster will be sent to either a sequencer (for recording volume commands) or to several keyboards and tone generators (for remote level control).

First select the **User Bank** program number that you want these assignments saved in.

Then assign all faders to send the MIDI command Continuous Controller by holding **PARM** and moving each fader (one at a time) until **Co** shows in the display.

Then assign all faders to controller number seven by holding VAL and **PARM#** and moving each fader (one at a time) until **07** shows in the display. (This requires a bit more care than entering PARM because there are many more possible values, therefore a slight change in fader position results in a large change in the value displayed.)

Then assign each fader to a different MIDI channel by holding **CHAN** and moving each fader until the desired MIDI channel is displayed.

Example: Expression Controller
You may own a keyboard that cannot send MIDI After Touch or Volume messages, but your rack-mount MIDI tone generators can respond to these commands. You could set the first two faders on FaderMaster to send After Touch and Volume commands on MIDI channel 1 (or any other channel). The next two faders could then be set to send the same commands on a different MIDI channel. Assigning all eight faders in this manner would then give you independent expression control over four different slaves. Place FaderMaster next to (or on top of) your keyboard for easy access, and hook up according to the diagrams.

First select the **User Bank** program number that you want these assignments saved in.

Then assign faders 1, 3, 5, and 7 to send the MIDI command After Touch by holding **PARM** and moving those faders (one at a time) until **AF** shows in the display.

Then assign faders 2, 4, 6, and 8 to send the MIDI command Continuous Controller by holding **PARM** and moving those faders (one at a time) until **Co** shows in the display.

Then assign faders 2, 4, 6, and 8 to controller number seven by holding VAL and **PARM#** and moving those faders (one at a time) until **07** shows in the display.

Then assign the first fader to MIDI channel 1 by holding **CHAN** and moving the fader until **01** is displayed. Assign the second fader to the same MIDI channel in a similar manner.

Assign the next two faders to channel 2, and then continue to assign the faders in pairs until you have selected the channel numbers for all eight faders.

Example: Remote control of a signal processing device.
First check the list of FaderMaster's factory presets to see if your signal processor is already included in the Factory Bank. (This would save you the time of defining your own custom setup.) If it is not, then read your signal processor's manual thoroughly to determine just what parameters can be controlled via MIDI. For this example, we will consider the Alesis *QuadraVerb*™.

First familiarize yourself with pages 37-39, 66-69, and page 81 of the *QuadraVerb*™ instruction manual. You will find that about 50 parameters can be remotely controlled via MIDI commands, including E.Q. settings, Delay Time, Lezlie Speed, Feedback, Decay Times, etc.

You will first assign all eight faders to the same MIDI channel, and then assign all eight faders to send Continuous Controller commands, each with a different Controller (Parameter) number.

First select the **User Bank** program number that you want these assignments saved in.

Then assign FaderMaster's MIDI channel by holding CHAN and moving each fader one at a time. Set all eight faders for the same channel. Then select the MIDI channel for the *QuadraVerb*™ by pressing its MIDI and VALUE buttons.

Then assign all faders to send the MIDI command Continuous Controller by holding **PARM** and moving each fader (one at a time) until **Co** shows in the display.

Then assign the faders to sequential controller numbers by holding VAL and **PARM#** and moving each fader (one at a time). Move the first fader until **01** is displayed, the second **02**, the third **03**, etc. (This choice of controller numbers is convenient although somewhat arbitrary.)

On the signal processor, you must define what Alesis calls MOD SOURCES and MOD TARGETS. To select the first MOD SOURCE, press MOD, and then press VALUE until "CONTROLLER 000" is displayed. Select 001, and then press the PAGE button to define the MOD TARGET. This will be the parameter inside the *QuadraVerb*™ that will be affected by moving FaderMaster's fader number 1.

Pressing the VALUE button on the *QuadraVerb*™ allows you to select the target parameter. The selections available will depend on whether you are in "QuadraMode", "Lezlie", "Graphic", or "5 Band" configurations.

After selecting MOD Source and Target, select MOD Amplitude by pressing the PAGE up button. Hold the VALUE button (on the*QuadraVerb*™) and set to the maximum amplitude.

In a similar manner, continue to define sources, targets, and amplitudes for faders 2 through 8.

Remember that you can set the faders for different MIDI channels to control the parameters of more than one signal processing device.

For example, faders one through four could send on MIDI channel 1, while faders five through eight could send on MIDI channel 2. The "MIDI Thru" of the signal processor would be hooked up to the MIDI In of the second signal processor.

Remember that FaderMaster not only provides "real-time" access to your signal processor's internal parameters, but also that this data can be loaded into a MIDI sequencer for automated effects control.

In that case, the "MIDI Thru" of the signal processor would then be hooked up to the MIDI In of the sequencer. Alternately, the MIDI Out of FaderMaster can be hooked up to the MIDI In of the sequencer, and the MIDI Out of the sequencer to the MIDI In off the signal processor. In that case, the "echo thru" function of the sequencer should be enabled.

Setting Fader Attributes

Minimum and Maximum

FaderMaster sends out MIDI numerical values ranging from 0 to 127. It is sometimes desirable to limit the numerical range of a fader. For example, say that you are controlling a MIDI device with 32 presets. If a fader has been assigned to send program change commands, you may want to limit the maximum value of the fader to 32, instead of 127. That way the whole fader "throw" will be useful. Otherwise the upper half of the fader's travel will send MIDI commands that your slave may ignore. As another example, say that you are sending After Touch commands to a tone generator. You may discover that for a given patch the After Touch message has no significant effect on the sound until the fader is more than halfway up. In this case, setting the minimum value for the fader at 63 instead of zero will give you greater control over the effective range.

To set the minimum value for a fader, press and hold **MIN** and move the fader until the desired value is displayed.

To set the maximum value for a fader, press and hold **VAL** and **MAX** and then move the fader until the desired value is displayed.

Values above 99 will be shown flashing, with a "1" alternating with the lowest two digits.

You may press MIN or MAX at any time to view the settings for the last fader moved.

Minimum and Maximum values may be set for each individual fader, and those settings are stored in the currently selected program in the User Bank. That is, these settings may be different for each program in the User Bank.

When the Maximum value is set to a number less than the Minimum value, the fader will operate reversed, sending out its highest value when moved all the way down.

Speed

The computer inside FaderMaster is constantly scanning the faders to see if they have been moved. An individual fader may be scanned from 6 to 100 times in a second. Generally speaking, the higher the scan speed, the more responsive the fader behaves.

For example, a fader assigned to send program change commands should ideally be set to the slowest scan speed. This allows FaderMaster to send only one MIDI message when a fader is moved very slightly, rather than just spewing out 30 program change commands. As another example, a fader may have been assigned to send Pitch Bend commands with a restricted range (using Min and Max). A slow scan rate would allow the introduction of a fixed amount of key transposition, rather that a smooth bend. For the smoothest volume changes, use a higher rate. A slow rate would result in a sudden jump in level, which may be desirable in limited applications.

To set the speed for a fader, press and hold **VAL** and **SPEED** and move the fader until the desired value is displayed. The number "01" indicates the fastest scan rate (100 per second), while the number "16" indicates the slowest rate (6.25 per second.)

You may select **SPEED** at any time to view the setting of the last fader moved.

The speed may be set differently for each individual fader, and those settings are stored in the currently selected program in the User Bank. That is, these settings may be different for each program in the User Bank.

Grouping
Any fader may be "grouped" to be controlled by any other fader. For example, one or two faders may be assigned to be "group masters" for effecting simultaneous level control of several instruments. Alternately, certain special effects may be achieved such that moving one fader will cause simultaneous transmission of Volume, Pitch Bend, After Touch, and Modulation (Controller) commands (on different MIDI channels, if desired.)

When a fader has had it range reversed (using Max and Min), another fader grouped to it will create a cross fade function. For example, sliding up a fader could bring up Modulation while bringing down After Touch. Or, more likely, a MIDI Volume cross fade could be recorded onto a sequencer.

Press **Group** to view the group assignment for the last fader moved. When "**0**" is displayed, that fader is not assigned to any other fader. When a "**1**" through "**8**" is shown, it means that the fader is grouped to the fader number displayed.

For example, suppose fader number two is the last fader moved. Then GROUP is pressed and a "**1**" is displayed. That means that fader 2 is grouped to fader 1, so moving Fader 1 will send out data for both faders.

To change group assignments, move the fader while holding GROUP until the desired fader number is displayed. A fader may not be assigned to itself.

The individual faders' Minimum and Maximum settings would still be in effect. However, when grouping faders together the Speed of the master fader will the speed for any slaves.

Example: Grouping Level Control
In a previous example it was shown how to assign the faders to send out volume commands on different MIDI channels. Suppose that now you want fader number 8 to be a group master.

Hold **GROUP** and then assign all faders to fader number 8 by moving each fader (one at a time) until **08** shows in the display.

Now when you move fader number eight, volume data will be sent out just as if you had moved faders one through eight simultaneously.

Sequencer mixing: SNAPSHOT function

Suppose that you are recording Controller data (like volume and modulation) onto a sequencer. You may want to record some initial MIDI Controller commands on the first beat of the song. But it would be inconvenient to start the sequencer and then try to very quickly move each fader a little to record the data. FaderMaster can send out a "snapshot" burst of MIDI messages corresponding to the current position of all the faders, without having to actually move any of the faders.

To use this SNAPSHOT function, first set your faders at the desired levels. Then start your sequencer in record and simultaneously press **MIN, GROUP, and VAL**. FaderMaster will then send out a burst of MIDI messages corresponding to the current values of each fader.

Sequencer mix editing: MERGE function

After you have recorded volume related data on your sequencer, you may want to edit that data. FaderMaster's special MERGE modes are designed to simplify the editing of both Continuous Controller and Note data. (Recall that Continuous Controller data is used for volume and modulation and such, whereas Note data is used to drive certain MIDI-controlled audio attenuators. Note data is also recognized by certain digital signal processors.)

The procedure will be to play the previously recorded data from the sequencer into FaderMaster, while re-recording the corrected data coming out of FaderMaster onto a new sequencer track. This is a fairly fail-safe method, in that you need not erase the old volume track until the new track has been proven to give audibly pleasing results. All this assumes, of course, that your sequencer has the ability to easily select which tracks are in playback and which are in record status. (That may be difficult on certain hardware sequencers.)

FaderMaster has three Merge Modes, and these can be independently set for each individual fader assigned to send Continuous Controller or Note commands.

Merge Modes Defined

Merge Unconditionally On

Normally, MIDI data received by FaderMaster is "unconditionally merged" with fader commands. That is, any data that comes into FaderMaster goes right back out the MIDI output, mixed with the data produced by moving a fader.

Merge Unconditionally Off

This mode is used for completely replacing a track of Controller data. For example, say you have used FaderMaster to record some volume tracks on a sequencer. You may want to completely redo several of those tracks while leaving the others intact.

Data coming into FaderMaster is first *tested*. If the fader is set to Merge Off, and if Note or Continuous Controller comes into FaderMaster with the same Parameter Number and MIDI channel number that the fader is set for, that data is not passed through. It may then be *replaced* by new data when the fader is moved. It is this new data that is recorded onto a new sequencer track.

Conditional Merge

This mode is used for replacing sections of a track of Controller data. For example, say you have used FaderMaster to record some volume tracks on a sequencer. You may want to redo certain parts of those tracks while leaving the rest intact.

Data coming into FaderMaster is first *tested*. If the fader is set to Conditional Merge, and if Note or Continuous Controller comes into FaderMaster with the same Parameter Number and MIDI channel number that the fader is set for, that data *is* passed through *until the fader is moved*. The volume data will then be *replaced* by new data when the fader is moved. It is this new data that is recorded onto a new sequencer track. Momentarily pressing either CHAN, PARM, MIN, or GROUP will once again allow data to pass through for that fader (i.e. effect a punch out), until the fader is moved again. In other words, this mode allows the momentary interruption of the flow of MIDI Note or Continuous Controller data through FaderMaster. During that interruption, new data may be inserted.

Assigning Merge Modes
To view or change the merge assignment for a given fader, Hold **VAL** and then press **MERGE**. The display will show one of the following:

oN = Merge unconditionally ON. All data is passed through FaderMaster and merged with fader data.

oF = Merge unconditionally OFF. Data coming into FaderMaster is tested. If the fader is set to Merge Off, and if Note or Continuous Controller comes into FaderMaster with the same Parameter Number and MIDI channel number that the fader is set for, that data is not passed through.

Co = Conditional Merge. The data coming into FaderMaster is tested as above. A merge will take place until the corresponding fader is moved. At that point the data coming in is not passed through, but is replaced by fader data. A momentary push of the CHAN, PARM, MIN, or GROUP button allows MIDI data to be merged again.

Example: Sequencer mix editing #1
Suppose that you have recorded eight tracks of volume data on your sequencer. The MIDI data is Continuous Controller #7, and each track is on a different MIDI channel. You have just played back your sequence while monitoring the audio output of your tone generators. The instrument on MIDI channel four is poorly mixed, and the instrument on MIDI channel 5 is O.K. until the end of the song. Thus you need to completely replace the data on track 4 (corresponding to fader 4), and replace just the tail end of the data on track 5 (corresponding to fader 5).

Set up your sequencer to play the volume tracks while recording eight new tracks of data. How you do this will depend on the "architecture" of your sequencer, and will probably be much easier on a software sequencer than a hardware sequencer. A hardware sequencer may have all the volume data residing on one track. This should not pose any difficulty. In this case, set up the hardware sequencer to play out that one track while recording a new track.

Hook up your MIDI cables via a switch box or thru box so that the output of FaderMaster gets routed to the input of the sequencer and to the input of the tone generators. The output of the sequencer goes to the input of FaderMaster.

Put fader 4 into Merge Off Mode by holding VAL and MERGE and moving fader 4 until **oF** is displayed. Put fader 5 into Conditional Merge Mode by holding VAL and MERGE and moving fader 5 until **Co** is displayed.

Start the sequencer and redo fader 4's moves. The old volume data will go into FaderMaster, and will come out with fader 4's data replaced with the new data. When you approach the end of the sequence, start moving fader 5 to correct the old volume data. From the time that you first move fader 5, that channel of data will be intercepted and replaced. Let the sequence run to the end. Momentarily push either of the CHAN, PARM, MIN, or GROUP buttons to restore merging on fader 5. Play back the sequence to audit the results.

Sequencer mix editing: Null function (Conditional Merge Mode)
You have seen that FaderMaster's Conditional Merge Mode allows the replacement of sections of Note or Continuous Controller data. When combined with the NULL function, it is possible to seamlessly replace those sections without any jumps in level. To do this requires that your fader values at the beginning and end of the replacement must be equal to the values on the original volume track. The NULL function permits the monitoring of the difference between the value of the data coming in and the position of a fader. The fader is said to be "nulled" when the displayed difference equals 00.

At the beginning of the replacement (that is, "punch-in"), a fader may be moved into the "nulled" position before it actually sends any data. Towards the end of the replacement the fader may again be moved into a new "nulled' position, while still replacing the old data. Then the fader is "punched-out" so that the remainder of the volume track is left unchanged.

This features only applies to faders assigned to Note or Continuous Controller data with Conditional Merge Mode Selected.

Once again, the procedure will be to play the previously recorded data from the sequencer into FaderMaster, while re-recording the corrected data coming out of FaderMaster onto a new sequencer track.

When the sequence approaches the section of volume data that you wish to replace, null the fader by first holding **VAL** and pressing **NULL.** If the fader position is too high, a positive number will be displayed, if the fader is too low, a negative number will be displayed. Move the fader until the difference value shown in the display is equal to double zero (**00**). While you are holding down NULL, you may move the fader into position without data being sent out yet. Then release VAL and NULL, and as soon as you move the fader you will be replacing the old data. (Recall that you are in Conditional Merge Mode, and data was passing through FaderMaster until you moved the corresponding fader.)

When the sequence approaches the end of the section of volume data that you wish to replace, once again null the fader by first holding **VAL** and pressing **NULL.** While you are holding down NULL, data is still being sent as you move the fader. If the fader position is too high, a positive number will be displayed, if the fader is too low, a negative number will be displayed. Move the fader until the difference value shown in the display is equal to **00**. Then release VAL and NULL, and quickly press either **CHAN**, **PARM**, **MIN**, or **GROUP**. This will "punch-out" the faders. (Recall that you are in Conditional Merge Mode, and the old data will once again begin to pass through FaderMaster when you hit either the CHAN, PARM, MIN, or GROUP buttons.)

Example: Sequencer mix editing #2
Borrowing from the last example, let us suppose that fader number 5 is still in the Conditional Merge Mode. We want to replace the middle of track with new volume data, but we want the new data to be dropped in seamlessly.

Start the sequencer. Do not move fader 5 yet. When the sequence approaches the region you intend to edit, null fader 5 by holding VAL and NULL, and while holding VAL and NULL move fader 5 until the difference shown in the display is equal to **00**. Then release VAL and NULL, and begin moving the fader to replace the old volume data.

Towards the end of the intended edit, null the fader again by holding VAL and NULL, and moving the fader until the difference displayed is equal to **00**. Then release VAL and NULL, and quickly press either of the CHAN, PARM, MIN, or GROUP buttons to restore the normal flow of data through FaderMaster. Let the sequence run to the end. Then play it back to audit the results.

Non Registered Controllers

Certain synthesizers (Ensoniq, for example) and signal processors can respond to Non Registered Controller commands. When a fader assigned to **NC** is moved, a 7-byte long message is sent. This message contains both a "most significant byte" and a "least significant byte", followed by a value. The "most significant byte" number defaults to 0 on power up. The "least significant byte" is the parameter number (**PARM#**) for the fader. The value represents the position of the fader.

Example: Ensoniq SQ-80

The Ensoniq SQ-80 will change its "pan position" in response to a Non Registered Controller command with the "least significant byte" set to 107 (that is, 6B hexadecimal). Use the standard fader assignment procedure of holding down a button and moving a fader until the desired value is displayed. Assign MIDI **CHAN** to agree with the MIDI channel of the SQ-80, set **PARM** to **NC**, then set **PARM#** to **107**.

It is also possible to change the "most significant byte" assignment on FaderMaster. To do this involves using two faders. The position of the second fader will set the value of the "most significant byte".

This second fader must be set to send Continuous Controller #99, and must also be set to the same MIDI channel as the **NC** fader. You should probably set the Minimum value to 0 and the Maximum value to 1 or 2 for this fader, unless you are sure you need a larger range. (Since one fader selects the "most significant byte", and another fader sets the value of the "least significant byte", this provides over 16,000 possible Non Registered Controller numbers!)

Example: Ensoniq SQ-80

The Ensoniq SQ-80 will change its Pitch Bend response *range* in response to a Non Registered Controller command with the "least significant byte" set to 07. The "most significant byte" must be set to 01. Use the standard fader assignment procedure of holding down a button and moving a fader until the desired value is displayed. First assign for one fader the **CHAN**, set **PARM** to **NC**, then set **PARM#** to **7**.

Now set a different fader to the same MIDI channel number, and set its **PARM** to **Co**. Set this fader's **PARM#** to **99**. Set the **MAX** for this fader to **01**. Move this fader all the way up to internally set the "most significant byte" number to 1. Now when you move the first fader (assigned to **NC**), FaderMaster will send the desired commands.

Delay Mode: MIDI Note and Continuous Controller Commands
Any of the first seven faders may be set to delay the transmission of MIDI Note or Continuous Controller commands. Faders set to Delay Mode do not send any data. Rather, the position of the fader determines how much Note or Controller commands passing through FaderMaster will be delayed. A fader will only delay data of the same Parameter, Channel, and Parameter Number. The range for this delay is from 0 to 15 Milliseconds.

Faders 1 through 7 may be put into Delay Mode by holding VAL and MERGE, and moving the fader **dL** is displayed.

Note On delay time will equal and Note Off delay time. (Also, the "release velocity" of a Note Off message is lost when delayed.)

Example: Drum Feel
Suppose that your drum tracks reside on your sequencer as MIDI Note commands. These MIDI Notes are all on the same channel. (Say, channel 16 for example.) You are using a drum machine or a tone generator to provide the percussion sounds.

To use FaderMaster to alter the "feel" of the drum tracks, first insert it into the MIDI data path between the sequencer and the drum machine. (See hookup diagrams.) Assign faders 1 through 7 to Note commands by holding **PARM** and moving each fader until **No** is displayed. Assign those faders to MIDI channel 16 by holding **CHAN** and moving each fader until **16** is displayed. Assign faders 1 through 7 to Delay Mode by holding VAL and MERGE and moving each fader until **dL** is displayed.

Next, refer to the instruction manual of your drum machine to determine which MIDI note numbers correspond to which sounds on your drum machine.

Then, while holding VAL and **PARM#**, move faders 1 through 7 one at a time until the desired note number is displayed for each.

Now start the sequencer and listen to the subtle timing effects achieved by moving the faders.

The delayed data coming out of FaderMaster can be re-recorded onto another sequencer track to incorporate these timing changes into the sequence. In that case, use a switch box or thru box to route the output of FaderMaster to both the sequencer and the drum machine.

Delay Mode: MIDI Clock
Fader number 8 can be assigned to delay the transmission of MIDI timing clocks.

While holding VAL and MERGE, move fader 8 until **dL** is displayed. Fader 8 will now not send any data; the Parameter, Channel, and Parameter Number settings are ignored. Moving fader 8 gives a delay time ranging from 0 to 15 milliseconds.

Chapter 5 Sysex Bank

This bank is used for gaining remote control over parameters within devices only accessible via MIDI Systems Exclusive messages and not included in the factory preset bank. The Sysex Bank may be loaded with the optional FaderMaster Disk. If you wish to write your own program, refer to the Systems Exclusive documentation in Chapter 8.

The factory-loaded default settings will control the **ART MultiVerb™.**

Because parameter manipulation in the MultiVerb™ is a rather complicated process, it is dealt with in Appendix B.

Selecting Sysex Bank
The Programmable Sysex Bank is designated **P1**. (While holding the BANK button you may rapidly go to **P1** by moving any fader.)

When a fader is moved while in the Sysex Bank, a data stream of up to 14 bytes long is sent out.

Fader Attributes
For each fader, you may enter Speed, Minimum, and Maximum values, as described in the last chapter, pages 19 and 20.

Refer to instructions in Appendix E to use the optional FaderMaster Program Disk for loading the Sysex Bank P1.

Chapter 6 Factory Bank

The Factory Bank consists of thirty presets. These have been programmed to allow FaderMaster to function as a remote controller for specific instruments. Refer to Appendix A to find out what products and parameters may be remotely controlled . These presets are designed to facilitate both programming and real-time control.

Selecting Factory Bank
The thirty programs in the Factory Bank are designated **F1** through **F9**, and then **10** through **30**. Pressing the BANK button advances the program number by one. (Holding CHAN and pressing BANK decrements the program number by one.) While holding the BANK button you may rapidly go to the desired program by moving any fader.

These presets are stored in FaderMaster's internal EPROM, and are not user-changeable EXCEPT that certain instruments may also include a "channel number" as part of a Sysex message. This is more accurately called a Sysex Device Number.

Setting the MIDI channel for any fader sets the Sysex channel number for all eight faders. These changes will be saved in the battery-backed memory.

Refer to the **Comments** in the Appendix A Factory Bank Sheet to determine if a given instrument allows a Device Number to be selected. This is indicated by **"m= bank's chan#"**.

The Fader Attributes are preset, and the Merge Modes do not apply.

Remember that FaderMaster's output may be recorded onto a MIDI sequencer. The sequencer can then provide automated playback of of your parameter changes.

Since most of the presets use MIDI Systems Exclusive Data, first make sure that your sequencer can record such data.

Chapter 7 Sysex Implementation

All FaderMaster Sysex messages have the general form:
F0h, 15h, 11h, cc, xx,<data>, F7h where cc = Command Code.

F0h, 15h, 11h, 00, F7h:
This is a Dump Request. There are no data bytes; when FaderMaster receives this message, it will reply with a Sysex Dump of all "U"and"P" Banks.

F0h, 15h, 11h, 01, <data>, F7h:
This is a Sysex Dump. There are 9 User banks of 80 bytes each, 1 Sysex bank of 64 bytes each, then 1 bank of Sysex bank header data (see below).

F0h, 15h, 11h, 02, xx, F7h: xx = 0 to 10
This is a request for one bank's dump, with xx = 0 for bank U1 up to xx = 9 for P1.

F0h, 15h, 11h, 03, (xx),<data>, F7h:
This is the Sysex Dump of one "U" or "P" bank. This dump will have either 80 or 64 bytes of data, depending on whether it is a "U" bank or "P" bank. The "xx" is not sent from the FaderMaster, but is required by the FaderMaster to specify where to store the data.

F0h, 15h, 11h, 04,F7h:
This is a request of the Sysex Header data for the "P" bank.

F0h, 15h, 11h, 05, <data>, F7h:
This is the Sysex Dump of the "P" bank's Sysex Header data.

User Bank Dump: 80 bytes each, with 10 bytes for each of 8 Faders. Fader 1 is sent first. All data only occupies low 4 bits. Each fader's data looks like:

Byte 0 = Midi Channel Number.
Byte 1 = Parm Type (9 = Note, 11 = Controller, 12 = Program Change,
13 = After touch, 14 = Pitch Bend, 15 = Non-Registered Controller.)
Byte 2 = Low nibble of Minimum value.
Byte 3 = High nibble of Minimum value. Bit 3 = Mode bit 0 (see below).
Byte 4 = Low nibble of Maximum value.
Byte 5 = High nibble of Maximum value. Bit 3 = Mode bit 1.
Byte 6 = Speed. 0 = 100 scans/sec, 15 = 6 scans/sec.
Byte 7 = Group. 0 = no assignment, 1 thru 8 = assign to that fader #.
Byte 8 = Low nibble of Parameter Number.
Byte 9 = High nibble of Parameter Number.

Mode bit 0	Mode bit 1	Function
0	0	Merge ON
1	0	Merge OFF
0	1	Merge Conditional
1	1	Delay Function

"P" Bank Dump: 64 bytes, with 8 bytes for each of 8 faders. Fader 1 is sent first. All data occupies low 4 bits of byte. Each fader's data looks like:

Byte 0 = Low nibble of Minimum
Byte 1 = High nibble of Minimum
Byte 2 = Low nibble of Maximum
Byte 3 = High nibble of Maximum
Byte 4 = Speed. As above.
Byte 5 = Always = 00
Byte 6 = Low nibble of Parameter Number.
Byte 7 = High nibble of Parameter Number.

"P" Bank Header Dump: This is the global data that is sent for each fader's movement. Up to 13 bytes of Sysex header data may be specified for the header.

This header data is nibblized and preceeded by a "count" nibble which indicates the number of bytes of header being nibblized which are in the dump. The SOX (F0h) and EOX (F7h) are understood, and not sent as part of this dump.

There are some "special" codes that may be imbedded in this string (nibblized, or course.) These specify where in the string the Parameter Number and fader value get inserted by FaderMaster when a fader is moved. They also specify where, if at all, a check-sum gets inserted. These special codes are not actually sent by FaderMaster when the fader is move: they are used internally as cues.

The special codes are:

F1h- "Insert Fader Value Here"

F3h- "Clear Checksum" See the sysex implementation for your unit to see if a checksum is used. You may have to contact the manufacturer to find out where the calculation of the checksum starts. This F3h is used to indicate the starting point.

F4h- "Send Roland Checksum Here". The Roland Checksum will be inserted at this point in the sysex string.

F5h- "Send Checksum Here". This will send the "other" kind of checksum.

F6h- "Send Parameter Number Here". The individual fader's user-programmable Parameter Number will be sent at this point in the sysex string.

Example of "P" Bank Header Dump:
If we desire to send: F0h, 45h, 18h, 2, mm, vv, cs, F7h where mm is the fader's Parameter Number , vv is its value, and cs is a checksum that covers from just after the 18h, we would send a "P" Bank Header Dump of:

F0h, 15h,11h, 05, 6, 5, 4, 8, 1, 3, Fh, 2, 0, 6, Fh, 1, Fh, 5, Fh, F7h
The first "6" indicates that 6 bytes of data follow in nibblized form. The 5 is the low nibble of the "45h" etc. The F3h, F6h, F1h, and F5 are the special codes.

Chapter 8 Troubleshooting and Service

Fader Response
If a fader doesn't appear to do anything, check the following first:

(1) Is it set to Delay Mode? A fader will not send any data in Delay Mode. Move the fader, and then hold VAL and press Merge to observe status.

(2) Is the range reasonable? A fader will not send any data if its MIN value is equal to its MAX value. The fader will not do too much if the MAX value is set very close to the MIN value.

(3) Is the MIDI Channel number in agreement with the device you are trying to control?

(4) Is the slave device set up to respond to the type of command that you are sending it?

If a fader is doing "too much", check your group assignments, one fader at a time. You may have accidentally grouped several commands on one fader. Perhaps the fader's Speed has been set too high for the application.

Clearing Memory
If you've programmed in completely confusing settings, or if the memory has been scrambled by an AC power surge, you may want to initialize FaderMaster's memory. If BANK, CHAN, and PARM are simultaneously depressed while turning the unit on, all **User Banks will be cleared** and reloaded with the following default setting: Faders 1 through 8 are set to send MIDI Continuous Controller commands. In U1, faders are assigned to controller numbers 0 through 7. In U2, faders are assigned to controller numbers 8 through 15, etc. All faders set to MIDI channel 1, with maximum scan speed, full range, merge on, and no grouping. The Programmable Sysex Bank (P1) is reloaded with data to control the ART MultiVerb™.

Zipper Noise
While using FaderMaster to control levels or signal processors, you may happen to notice a soft tearing or stepping sound coming from the audio output of the slave. It is called "zipper noise" and **has nothing to do with FaderMaster.** It is entirely related to the design of the MIDI controlled device. The tone generator or signal processor may not be capable of responding smoothly to MIDI commands. In fact, the noise may appear while varying certain parameters in an instrument and not appear on other parameters in the same instrument.

Program Changes
If using FaderMaster to send Program Change Commands, you should know that some instruments interpret a "0" as Program #1. This varies with different manufacturers and the only way to tell is to experiment.

Service
If you experience any operational difficulties, let us reassure you that every unit is 100% factory tested. It worked when it left the factory, otherwise it wouldn't have been shipped.

The most common cause of problems is a "noisy" AC outlet. We recommend the use of an AC line filter with all computer related equipment. These can be purchased at any computer or hardware store, and most music stores also now carry them. Be sure that it has both surge suppression and line filtering.

There are no "user-serviceable" parts inside FaderMaster. For warranty service in the U.S. in the event of a malfunction, call the factory to obtain a Return Authorization before sending the unit back.

Please, read the manual and debug your system before calling the factory.

Appendix

Appendix A
Factory Bank Presets

FaderMaster's 30 Factory Bank Presets are designed to ease real-time control of several popular instruments. The following tables show the function of each fader along with the format of the actual MIDI messages sent. If the "Comments" column includes the words "m=bank's chan", a System Exclusive Device Number may also be user-selected.

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FaderMaster
Factory Bank Sheet

Bank F1 General Purpose Midi Volume, Channels 1-8

Fader	Function	Message	Comments
1	Midi Volume, Chan 1	B0h,07,vv	vv = fader value, with min.=0
2	Midi Volume, Chan 2	B1h,07,vv	and max. = 127
3	Midi Volume, Chan 3	B2h,07,vv	
4	Midi Volume, Chan 4	B3h,07,vv	
5	Midi Volume, Chan 5	B4h,07,vv	
6	Midi Volume, Chan 6	B5h,07,vv	
7	Midi Volume, Chan 7	B6h,07,vv	
8	Midi Volume, Chan 8	B7h,07,vv	

Bank F2 General Purpose Midi Volume, Channels 9-16

Fader	Function	Message	Comments
1	Midi Volume, Chan 9	B8h,07,vv	vv = fader value, with min. = 0
2	Midi Volume, Chan 10	B9h,07,vv	and max. = 127
3	Midi Volume, Chan 11	BAh,07,vv	
4	Midi Volume, Chan 12	BBh,07,vv	
5	Midi Volume, Chan 13	BCh,07,vv	
6	Midi Volume, Chan 14	BDh,07,vv	
7	Midi Volume, Chan 15	BEh,07,vv	
8	Midi Volume, Chan 16	BFh,07,vv	

Bank F3 General Purpose Midi Pan, Channels 1-8

Fader	Function	Message	Comments
1	Midi Pan, Chan 1	B0h, 0Ah,vv	vv = fader value, with min.=0
2	Midi Pan, Chan 2	B1h, 0Ah,vv	and max. = 127
3	Midi Pan, Chan 3	B2h, 0Ah,vv	
4	Midi Pan, Chan 4	B3h, 0Ah,vv	
5	Midi Pan, Chan 5	B4h, 0Ah,vv	
6	Midi Pan, Chan 6	B5h, 0Ah,vv	
7	Midi Pan, Chan 7	B6h, 0Ah,vv	
8	Midi Pan, Chan 8	B7h, 0Ah,vv	

Bank F4 General Purpose Midi Volume, Channels 9-16

Fader	Function	Message	Comments
1	Midi Pan, Chan 9	B8h,0Ah,vv	vv = fader value, with min. = 0
2	Midi Pan, Chan 10	B9h,0Ah,vv	and max. = 127
3	Midi Pan, Chan 11	BAh,0Ah,vv	
4	Midi Pan, Chan 12	BBh,0Ah,vv	
5	Midi Pan, Chan 13	BCh,0Ah,vv	
6	Midi Pan, Chan 14	BDh,0Ah,vv	
7	Midi Pan, Chan 15	BEh,0Ah,vv	
8	Midi Pan, Chan 16	BFh,0Ah,vv	

FaderMaster
Factory Bank Sheet

Bank F5 Oberheim Matrix 6 & Matrix 1000 Page 1

Fader	Function	Message	Comments
1	VCF Frequency	F0h,10h,6,6,15h,vv,F7h	vv=0 to 127
2	Env 1 to VCF Amnt.	F0h,10h,6,6,16h,vv,F7h	vv = 0 to 63
3	VCF Resonance	F0h,10h,6,6,18h,vv,F7h	vv = 0 to 63
4	LFO1 Speed	F0h,10h,6,6,50h,vv,F7h	vv = 0 to 63
5	LFO1 to DCO1 Amnt.	F0h,10h,6,6,01h,vv,F7h	vv = 0 to 63
6	LFO1 to DCO2 Amnt.	F0h,10h,6,6,0Bh,vv,F7h	vv = 0 to 63
7	DCO2 Detune	F0h,10h,6,6,0Ch,vv,F7h	vv = 0 to 63
8	DCO2 Frequency	F0h,10h,6,6,0Ah,vv,F7h	vv = 0 to 63

Bank F6 Oberheim Matrix 6 & Matrix 1000 Page 2

Fader	Function	Message	Comments
1	Env 1 Attack	F0h,10h,6,6,33h,vv,F7h	vv=0 to 127
2	Env 1 Decay	F0h,10h,6,6,34h,vv,F7h	vv = 0 to 63
3	Env 1 Sustain	F0h,10h,6,6,35h,vv,F7h	vv = 0 to 63
4	Env 1 Release	F0h,10h,6,6,36h,vv,F7h	vv = 0 to 63
5	Env 2 Attack	F0h,10h,6,6,3Dh,vv,F7h	vv = 0 to 63
6	Env 2 Decay	F0h,10h,6,6,3Eh,vv,F7h	vv = 0 to 63
7	Env 2 Sustain	F0h,10h,6,6,3Fh,vv,F7h	vv = 0 to 63
8	Env 2 Release	F0h,10h,6,6,40h,vv,F7h	vv = 0 to 63

Bank F7 Kawai K1 Page 1

Fader	Function	Message	Comments
1	Vol 1	F0h,40h,0m,10h,0,3,41,0,vv,F7h	vv=0 to 100
2	Vol 2	F0h,40h,0m,10h,0,3,41,2,vv,F7h	m= chan #
3	Vol 3	F0h,40h,0m,10h,0,3,41,4,vv,F7h	
4	Vol 4	F0h,40h,0m,10h,0,3,41,6,vv,F7h	
5	Detune 1	F0h,40h,0m,10h,0,3,30,0,vv,F7h	
6	Detune 2	F0h,40h,0m,10h,0,3,30,2,vv,F7h	
7	Detune 3	F0h,40h,0m,10h,0,3,30,4,vv,F7h	
8	Detune 4	F0h,40h,0m,10h,0,3,30,6,vv,F7h	

Bank F8 Kawai K1 Page 2

Fader	Function	Message	Comments
1	Atk 1	F0h,40h,0m,10h,0,3,43,0,vv,F7h	vv=0 to 100
2	Rel 1	F0h,40h,0m,10h,0,3,46,0,vv,F7h	m= chan #
3	Atk 2	F0h,40h,0m,10h,0,3,43,2,vv,F7h	
4	Rel 2	F0h,40h,0m,10h,0,3,46,2,vv,F7h	
5	Atk 3	F0h,40h,0m,10h,0,3,43,4,vv,F7h	
6	Rel 3	F0h,40h,0m,10h,0,3,46,4,vv,F7h	
7	Atk 4	F0h,40h,0m,10h,0,3,43,6,vv,F7h	
8	Rel 4	F0h,40h,0m,10h,0,3,46,6,vv,F7h	

FaderMaster
Factory Bank Sheet

Bank F9 Yamaha DX/TX General Control

Fader	Function	Message	Comments
1	Pgm Change, Chan. m	Cmh,vv	m=bnk's chan, vv=0 to 31
2	Midi Volume, Chan. m	Bmh,07,vv	vv = 0 to 127
3	Feedback	F0h,43h,1mh,1,7,vv,F7h	vv = 0 to 7
4	Transpose	F0h,43h,1mh,1,10h,vv,F7h	vv = 0 to 48
5	Key Sync	F0h,43h,1mh,1,8,vv,F7h	vv = 0 to 1
6	OPS Select	F0h,43h,1mh,1,1Bh,vv,F7h	vv = 0 to 63
7	LFO PMD	F0h,43h,1mh,1,0Bh,vv,F7h	vv = 0 to 99
8	LFO Amnt	F0h,43h,1mh,1,0Ch,vv,F7h	vv = 0 to 99

Bank F10 Yamaha DX/TX Osc Control

Fader	Function	Message	Comments
1	OP1 Coarse Freq.	F0h,43h,1mh,0,7Bh,vv,F7h	m=bnk's chan, vv=0 to 31
2	OP2 Coarse Freq.	F0h,43h,1mh,0,66h,vv,F7h	vv = 0 to 31
3	OP3 Coarse Freq.	F0h,43h,1mh,0,51h,vv,F7h	vv = 0 to 31
4	OP4 Coarse Freq.	F0h,43h,1mh,0,3Ch,vv,F7h	vv = 0 to 31
5	OP5 Coarse Freq.	F0h,43h,1mh,0,27h,vv,F7h	vv = 0 to 31
6	OP6 Coarse Freq.	F0h,43h,1mh,0,12h,vv,F7h	vv = 0 to 31
7	OP1 Fine Freq.	F0h,43h,1mh,0,7Ch,vv,F7h	vv = 0 to 99
8	OP2 Fine Freq.	F0h,43h,1mh,0,67h,vv,F7h	vv = 0 to 99

Bank F11 Yamaha DX/TX OP1 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,69h,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,6Ah,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,6Bh,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,6Ch,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,6Dh,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,6Eh,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,6Fh,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,70h,vv,F7h	vv = 0 to 99

Bank F12 Yamaha DX/TX OP2 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,54h,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,55h,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,56h,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,57h,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,58h,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,59h,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,5Ah,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,5Bh,vv,F7h	vv = 0 to 99

FaderMaster
Factory Bank Sheet

Bank F13 Yamaha DX/TX OP3 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,3Fh,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,40h,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,41h,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,42h,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,43h,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,44h,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,45h,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,46h,vv,F7h	vv = 0 to 99

Bank F14 Yamaha DX/TX OP4 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,2Ah,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,2Bh,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,2Ch,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,2Dh,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,2Eh,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,2Fh,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,30h,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,31h,vv,F7h	vv = 0 to 99

Bank F15 Yamaha DX/TX OP5 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,15h,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,16h,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,17h,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,18h,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,19h,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,1Ah,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,1Bh,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,1Ch,vv,F7h	vv = 0 to 99

Bank F16 Yamaha DX/TX OP6 Envelope Control

Fader	Function	Message	Comments
1	Rate 1	F0h,43h,1mh,0,0h,vv,F7h	m=bnk's chan, vv=0 to 99
2	Rate 2	F0h,43h,1mh,0,1h,vv,F7h	vv = 0 to 99
3	Rate 3	F0h,43h,1mh,0,2h,vv,F7h	vv = 0 to 99
4	Rate 4	F0h,43h,1mh,0,3h,vv,F7h	vv = 0 to 99
5	Level 1	F0h,43h,1mh,0,4h,vv,F7h	vv = 0 to 99
6	Level 2	F0h,43h,1mh,0,5h,vv,F7h	vv = 0 to 99
7	Level 3	F0h,43h,1mh,0,6h,vv,F7h	vv = 0 to 99
8	Level 4	F0h,43h,1mh,0,7h,vv,F7h	vv = 0 to 99

FaderMaster
Factory Bank Sheet

Bank F17 Roland D-10, D-20, D-110

Fader	Function	Message	Comments	
1	Pgm Chg Chan 1	C0h, vv	Voice 1 Pgm	vv=0 to 127
2	Pgm Chg Chan 2	C1h, vv	Voice 2 Pgm	vv=0 to 127
3	Pgm Chg Chan 3	C2h, vv	Etc.	
4	Pgm Chg Chan 4	C3h, vv		
5	Pgm Chg Chan 5	C4h, vv		
6	Pgm Chg Chan 6	C5h, vv		
7	Pgm Chg Chan 7	C6h, vv		
8	Pgm Chg Chan 8	C7h, vv		

Bank F18 Roland D-20

Fader	Function	Message	Comments
1	Master Volume	F0h,41h,10h,16h,12h,10h,0,0,vv,cs,F7h	cs=check sum, vv=0 to 100
2	Fine Tune	F0h,41h,0mh,16h,12h,2,0,3,vv,cs,F7h	vv = 0 to 127
3	Mod Depth	F0h,41h,0mh,16h,12h,2,0,23h,vv,cs,F7h	vv = 0 to 100
4	Mod Rate	F0h,41h,0mh,16h,12h,2,0,22h,vv,cs,F7h	vv = 0 to 100
5	Bend Range	F0h,41h,0mh,16h,12h,0,0,4,vv,cs,F7h	vv = 0 to 24
6	Reverb Mode	F0h,41h,1mh,16h,12h,10h,0,1,vv,cs,F7h	vv = 0 to 8
7	Reverb Time	F0h,41h,1mh,16h,12h,10h,0,2,vv,cs,F7h	vv = 0 to 7
8	Reverb Level	F0h,41h,1mh,16h,12h,10h,0,3,vv,cs,F7h	vv = 0 to 7

Bank F19 Roland D-50, D-550 Page 1

Fader	Function	Message	Comments
1	Lower LF EQ Freq	F0h,41h,0mh,14h,12h,0,2,65h,vv,cs,F7h	m=bnk's chan, vv=0 to 15
2	Lower LF Gain	F0h,41h,0mh,14h,12h,0,2,66h,vv,cs,F7h	vv = 0 to 24
3	Lower HF EQ Freq	F0h,41h,0mh,14h,12h,0,2,65h,vv,cs,F7h	vv = 0 to 21
4	Lower HF Gain	F0h,41h,0mh,14h,12h,0,2,65h,vv,cs,F7h	vv = 0 to 24
5	Upper LF EQ Freq	F0h,41h,0mh,14h,12h,0,2,25h,vv,cs,F7h	vv = 0 to 15
6	Upper LF Gain	F0h,41h,0mh,14h,12h,0,2,25h,vv,cs,F7h	vv = 0 to 24
7	Upper HF EQ Freq	F0h,41h,0mh,14h,12h,0,2,25h,vv,cs,F7h	vv = 0 to 21
8	Upper HF Gain	F0h,41h,0mh,14h,12h,0,1,29h,vv,cs,f7h	vv = 0 to 24

Bank F20 Roland D-50, D-550 Page 2

Fader	Function	Message	Comments
1	Reverb Type	F0h,41h,0mh,14h,12h,0,3,1Eh,vv,cs,F7h	m=bnk's chan, vv=0 to 31
2	Reverb Balance	F0h,41h,0mh,14h,12h,0,3,1Fh,vv,cs,F7h	cs=check sum, vv = 0 to 100
3	Chor. Lower Type	F0h,41h,0mh,14h,12h,0,2,2Ah,vv,cs,F7h	vv = 0 to 7
4	Chor. Lower Rate	F0h,41h,0mh,14h,12h,0,2,2Bh,vv,cs,F7h	vv = 0 to 100
5	Chor. Lower Depth	F0h,41h,0mh,14h,12h,0,2,2Ch,vv,cs,F7h	vv = 0 to 100
6	Chor. Upper Type	F0h,41h,0mh,14h,12h,0,1,2Ah,vv,cs,F7h	vv = 0 to 7
7	Chor. Upper Rate	F0h,41h,0mh,14h,12h,0,1,2Bh,vv,cs,F7h	vv = 0 to 100
8	Chor. Upper Dpth	F0h,41h,0mh,14h,12h,0,1,2Ch,vv,cs,F7h	vv = 0 to 100

FaderMaster
Factory Bank Sheet

Bank F21 Korg M-1 Page 1 Single Mode

Fader	Function	Message	Comments
1	Osc 1 Multisound	F0h,42h,3mh,19h,41h,1,8,vv,0,F7h	m=bnk's chan, vv=0 to 99
2	VDF 1 Cutoff	F0h,42h,3mh,19h,41h,3,9,vv,0,F7h	vv = 0 to 99
3	VDF 1 EG Intensity	F0h,42h,3mh,19h,41h,3,Ch,vv,0,F7h	vv = 0 to 99
4	VDA 1 Attack Time	F0h,42h,3mh,19h,41h,7,8,vv,0,F7h	vv = 0 to 99
5	VDA 1 Attack Level	F0h,42h,3mh,19h,41h,7,9,vv,0,F7h	vv = 0 to 99
6	VDA 1 Breakpoint	F0h,42h,3mh,19h,41h,7,Bh,vv,0,F7h	vv = 0 to 99
7	VDA 1 Sustain Level	F0h,42h,3mh,19h,41h,7,Dh,vv,0,F7h	vv = 0 to 99
8	VDA 1 Release Time	F0h,42h,3mh,19h,41h,7,Ehvv,F7h	vv = 0 to 99

Bank F22 Korg M-1 Page 2 Single Mode

Fader	Function	Message	Comments
1	Effect 1 type	F0h,42h,3mh,19h,41h,14,9,vv,0,F7h	m=bnk's chan, vv=0 to 33
2	Effect 1 Dry/Eff Bal	F0h,42h,3mh,19h,41h,15,Fh,vv,0,F7h	vv = 0 to 100
3	Effect 1 Hi EQ *	F0h,42h,3mh,19h,41h,15,Eh,vv,0,F7h	vv = -12 to +12
4	Effect 1 Lo EQ *	F0h,42h,3mh,19h,41h,15,Dh,vv,0,F7h	vv = -12 to +12
5	Effect 2 type	F0h,42h,3mh,19h,41h,16,9,vv,0,F7h	vv = 0 to 33
6	Effect 2 Dry/Eff Bal	F0h,42h,3mh,19h,41h,17,Fh,vv,0,F7h	vv = 0 to 100
7	Effect 2 Hi EQ *	F0h,42h,3mh,19h,41h,17,Eh,vv,0,F7h	vv = -12 to +12
8	Effect 2 Lo EQ *	F0h,42h,3mh,19h,41h,17,Dh,vv,F7h	vv = -12 to +12

Bank F23 Korg M-1 Page 3 Double Mode

Fader	Function	Message	Comments
1	Osc 1 Multisound	F0h,42h,3mh,19h,41h,1,8,vv,0,F7h	m=bnk's chan, vv=0 to 99
2	VDF 1 Cutoff	F0h,42h,3mh,19h,41h,5,9,vv,0,F7h	vv = 0 to 99
3	VDA 1 Release Time	F0h,42h,3mh,19h,41h,Dh,Eh,vv,0,F7h	vv = 0 to 99
4	Osc 2 Multisound	F0h,42h,3mh,19h,41h,2,8,vv,0,F7h	vv = 0 to 99
5	VDF 2 Cutoff	F0h,42h,3mh,19h,41h,9,9,vv,0,F7h	vv = 0 to 99
6	VDA 2 Release Time	F0h,42h,3mh,19h,41h,Ah,Bh,vv,0,F7h	vv = 0 to 99
7	Osc 1 Level	F0h,42h,3mh,19h,41h,1,Bh,vv,0,F7h	vv = 0 to 99
8	Osc 2 Level	F0h,42h,3mh,19h,41h,2,Bhvv,F7h	vv = 0 to 99

Bank F24 Korg M-1 Page 4 Double Mode

Fader	Function	Message	Comments
1	Effect 1 type	F0h,42h,3mh,19h,41h,23,9,vv,0,F7h	m=bnk's chan, vv=0 to 33
2	Effect 1 Dry/Eff Bal	F0h,42h,3mh,19h,41h,24,Fh,vv,0,F7h	vv = 0 to 100
3	Effect 1 Hi EQ *	F0h,42h,3mh,19h,41h,24,Eh,vv,0,F7h	vv = -12 to +12
4	Effect 1 Lo EQ *	F0h,42h,3mh,19h,41h,24,Dh,vv,0,F7h	vv = -12 to +12
5	Effect 2 type	F0h,42h,3mh,19h,41h,25,9,vv,0,F7h	vv = 0 to 33
6	Effect 2 Dry/Eff Bal	F0h,42h,3mh,19h,41h,26,Fh,vv,0,F7h	vv = 0 to 100
7	Effect 2 Hi EQ *	F0h,42h,3mh,19h,41h,26,Eh,vv,0,F7h	vv = -12 to +12
8	Effect 2 Lo EQ *	F0h,42h,3mh,19h,41h,26,Dh,vv,F7h	vv = -12 to +12

FaderMaster
Factory Bank Sheet

Bank F25 EMU Proteus Page 1

Fader	Function	Message	Comments
1	Primary Instrument	F0h,18h,4,0mh,3,23,0,vv,0,F7h	m=bnk's chan, vv=0 to 127
2	Primary Volume	F0h,18h,4,0mh,3,27,0,vv,0,F7h	
3	Primary Tune	F0h,18h,4,0mh,3,25,0,vv,0,F7h	
4	Primary Fine Tune	F0h,18h,4,0mh,3,26,0,vv,0,F7h	
5	Secondary Instrument	F0h,18h,4,0mh,3,41,0,vv,0,F7h	
6	Secondary Volume	F0h,18h,4,0mh,3,45,0,vv,0,F7h	
7	Secondary Tune	F0h,18h,4,0mh,3,43,0,vv,0,F7h	
8	Swcondary Fine Tune	F0h,18h,4,0mh,3,44,0,vv,0,F7h	

Bank F26 EMU Proteus Page 2

Fader	Function	Message	Comments
1	Primary Alt. Attack	F0h,18h,4,0mh,3,32,0,0,vv,F7h	m=bnk's chan, vv=0 to 127
2	Primary Alt. Decay	F0h,18h,4,0mh,3,34,0,0,vv,F7h	
3	Primary Alt. Sust.	F0h,18h,4,0mh,3,35,0,0,vv,F7h	
4	Primary Alt. Release	F0h,18h,4,0mh,3,36,0,0,vv,F7h	
5	Second. Alt. Attack	F0h,18h,4,0mh,3,50,0,0,vv,F7h	
6	Second. Alt. Decay	F0h,18h,4,0mh,3,52,0,0,vv,F7h	
7	Second. Alt. Sust.	F0h,18h,4,0mh,3,53,0,0,vv,F7h	
8	Second. Alt. Release	F0h,18h,4,0mh,3,54,0,0,vv,F7h	

Bank F27 EMU Proteus Page 3

Fader	Function	Message	Comments
1	LFO1 Shape	F0h,18h,4,0mh,3,64,0,0,vv,F7h	m=bnk's chan, vv=0 to 127
2	LFO 1 Freq	F0h,18h,4,0mh,3,65,0,0,vv,F7h	
3	LFO 1 Variation	F0h,18h,4,0mh,3,67,0,0,vv,F7h	
4	LFO 1 Amount	F0h,18h,4,0mh,3,68,0,0,vv,F7h	
5	LFO 2 Shape	F0h,18h,4,0mh,3,69,0,0,vv,F7h	
6	LFO 2 Freq	F0h,18h,4,0mh,3,70,0,0,vv,F7h	
7	LFO 2 Variation	F0h,18h,4,0mh,3,72,0,0,vv,F7h	
8	LFO 2 Amount	F0h,18h,4,0mh,3,73,0,0,vv,F7h	

Bank F28 Ensoniq VFX Page 1 Voice 1

Fader	Function	Message	Comments
1	Release Time	Bmh, 72, vv	m=bnk's chan, vv=0 to 127
2	Timbre	Bmh, 71,vv	vv = 0 to 127
3	Pitch Fine	F0h,Fh,5,0,0mh,1,0,10,2,vv, 0F7h	vv = 0 to 127
4	Filter Cutoff	F0h,Fh,5,0,0mh,1,0,12,1,vv, 0F7h	vv = 0 to 127
5	LFO Depth	F0h,Fh,5,0,0mh,1,0,17,3,vv, 0F7h	vv = 0 to 127
6	LFO Speed	F0h,Fh,5,0,0mh,1,0,17,0,vv, 0F7h	vv = 0 to 99
7	FX1 Amount	F0h,Fh,5,0,0mh,1,0,28,4,vv, 0F7h	vv = 0 to 127
8	FX2 Amount	F0h,Fh,5,0,0mh,1,0,28,5,vv, 0F7h	vv = 0 to 127

FaderMaster
Factory Bank Sheet

Bank F29 Ensoniq VFX Page 2 Voice 2

Fader	Function	Message	Comments
1	Release Time	Bmh, 72, vv	m=bnk's chan, vv=0 to 127
2	Timbre	Bmh, 71,vv	vv = 0 to 127
3	Pitch Fine	F0h,Fh,5,0,0mh,1,1,10,2,vv, 0F7h	vv = 0 to 127
4	Filter Cutoff	F0h,Fh,5,0,0mh,1,1,12,1,vv, 0F7h	vv = 0 to 127
5	LFO Depth	F0h,Fh,5,0,0mh,1,1,17,3,vv, 0F7h	vv = 0 to 127
6	LFO Speed	F0h,Fh,5,0,0mh,1,1,17,0,vv, 0F7h	vv = 0 to 99
7	FX1 Amount	F0h,Fh,5,0,0mh,1,1,28,4,vv, 0F7h	vv = 0 to 127
8	FX2 Amount	F0h,Fh,5,0,0mh,1,1,28,5,vv, 0F7h	vv = 0 to 127

Bank F30 Ensoniq VFX Page 3 Voice 3

Fader	Function	Message	Comments
1	Release Time	Bmh, 72, vv	m=bnk's chan, vv=0 to 127
2	Timbre	Bmh, 71,vv	vv = 0 to 127
3	Pitch Fine	F0h,Fh,5,0,0mh,1,2,10,2,vv, 0F7h	vv = 0 to 127
4	Filter Cutoff	F0h,Fh,5,0,0mh,1,2,12,1,vv, 0F7h	vv = 0 to 127
5	LFO Depth	F0h,Fh,5,0,0mh,1,2,17,3,vv, 0F7h	vv = 0 to 127
6	LFO Speed	F0h,Fh,5,0,0mh,1,2,17,0,vv, 0F7h	vv = 0 to 99
7	FX1 Amount	F0h,Fh,5,0,0mh,1,2,28,4,vv, 0F7h	vv = 0 to 127
8	FX2 Amount	F0h,Fh,5,0,0mh,1,2,28,5,vv, 0F7h	vv = 0 to 127

Appendix

Appendix B Sysex Bank Default Assignments

P1 : ART MultiVerb™

As shipped from the factory, the Sysex Bank program **P1** is set to control the ART MultiVerb™. Should you reprogram this bank and at some later time want to restore the MultiVerb™ settings, use the **INITIALIZE** function. (Hold BANK, CHAN, and PARM buttons while turning the unit on. **WARNING: This clears all programs in the User Bank!**)

Unfortunately, there are certain complications inherent to the sysex implementation of the MultiVerb™. Most notable is the fact that certain parameters (such as chorus speed or reverb level) do not have "fixed" parameter numbers. The numbers change around from program to program. That is, a given parameter number (and thus a given fader) will have a different effect depending on the currently selected MultiVerb™ program. Also, certain combinations of effects are internally grouped together in the MultiVerb™. Although it is essential to know how they are grouped to determine parameter settings, the front panel of the MultiVerb™ won't give you this information, it must be "deduced"!

To add to this difficulty, certain parameters have widely differing allowable maximum and minimum values.

To help you wade through this situation, we have prepared the following charts. We must assume a good level of understanding of the MultiVerb™ on your part.

Here is how to use the charts.

First select a program on the MultiVerb™. Find out which of the 19 internal effects are turned on. On the MultiVerb™, press DELETE EFFECT? several times to display the effects currently selected. Use the **Group Selection Chart** to find out the possible "Group Number" for that program. (There may be more than one.) For example, if the current program has Equalizer, Flanger, Panner, and Reverb 1, then its internal "Group Number" is either 22 or 23.

Next comes the harder part. To firmly establish the "Group Number", you must find out which additional effects *can* be turned on for that program. To determine which additional effects can be turned on, Press ADD EFFECT and note the display. If, for example, Regeneration Level is accessible, then you have established that the internal "Group number" is 22.

Now look at the **Parameter Selection Chart**. Find your "Group Number" in the left column, and then read across to find the name of the internal parameter of the MultiVerb™ that you want to control.

The appropriate FaderMaster parameter number (**PARM#**) is then found at the top of the column.

For example, say that you want fader 1 to control Panner Speed. For group 22 you find that you will need to send parameter number 13 to the MultiVerb™, as part of the Sysex message. So, hold VAL and **PARM#**, and move fader 1 until 13 is displayed.

Lastly, look at the **Abbreviations and Limits** table, to find the effective range of values for the parameter.

For example, Panner Speed has a minimum of 0 and a maximum of 15. Set the range of fader 1 by setting **MIN** to 0 and **MAX** to 15.

Multiverb Group Selection Chart

Group #	Equalizer	Flanger	Chorus	Pitch Xp	Panner	M DDL S	M DDL L	Reverb 1	Reverb 2	Reverb 3	Gate 1	Gate 2	Gate 3	TapDDlS	TapDDLL	Regen S	Regen L	Stereo S	Stereo L
0	Yes	Yes				Yes			Yes										
1	Yes	Yes					Yes	Yes											
2	Yes	Yes				Yes		Yes											
3	Yes		Yes			Yes		Yes				Yes							
4	Yes	Yes				Yes													
5	Yes	Yes					Yes				Yes								
6	Yes	Yes				Yes					Yes								
7	Yes		Yes			Yes					Yes								
8	Yes			Yes			Yes												
9	Yes			Yes		Yes													
10	Yes					Yes				Yes									
11	Yes					Yes							Yes						
12	Yes				Yes	Yes			Yes										
13	Yes				Yes		Yes	Yes											
14	Yes				Yes	Yes		Yes											
15	Yes				Yes	Yes						Yes							
16	Yes				Yes		Yes				Yes								
17	Yes				Yes	Yes					Yes								
18	Yes								Yes							Yes			
19	Yes							Yes							Yes				
20	Yes							Yes						Yes					
21	Yes				Yes				Yes							Yes			
22	Yes	Yes			Yes			Yes									Yes		
23	Yes	Yes			Yes			Yes						-		Yes			
24	Yes				Yes							Yes				Yes			
25	Yes				Yes						Yes						Yes		
26	Yes				Yes						Yes					Yes			b
27	Yes	Yes																	Yes
28	Yes	Yes																Yes	
29	Yes		Yes															Yes	
30	Yes				Yes														Yes
31	Yes				Yes													Yes	

MultiVerb Parameter Selection Chart

Group #	Parm 0	Parm 1	Parm 2	Parm 3	Parm 4	Parm 5	Parm 6	Parm 7	Parm 8	Parm 9	Parm 10	Parm 11	Parm 12	Parm 13
0	Group	Effect	Freq	Dly Time	F Type	F Width	F Speed	F Regen	R Type	R Decay	R Damp	R Posit	R Level	
1	Select	Enable	Freq	Dly Time	F Type	F Width	F Speed	F Regen	R Type	R Decay	R Damp	R Posit	R Level	
2			Freq	Dly Time	F Type	F Width	F Speed	F Regen	R Type	R Decay	R Damp	R Posit	R Level	
3			Freq	Dly Time	C Type	C Width	C Speed	C Base	R Type	R Decay	R Damp	R Posit	R Level	
4			Freq	Dly Time	F Type	F Width	F Speed	F Regen	G Type	G Decay	G Diff	G Level		
5			Freq	Dly Time	F Type	F Width	F Speed	F Regen	G Type	G Decay	G Diff	G Level		
6			Freq	Dly Time	F Type	F Width	F Speed	F Regen	G Type	G Decay	G Diff	G Level		
7			Freq	Dly Time	C Type	C Width	C Speed	C Base	G Type	G Decay	G Diff	G Level		
8			Freq	Dly Time	X Type	X Steps	X Fine	X Regen	X Level					
9			Freq	Dly Time	X Type	X Steps	X Fine	X Regen	X Level					
10			Freq	Dly Time	R Type	R Decay	R Damp	R Posit	R Diff	R Level				
11			Freq	Dly Time	G Type	G Decay	G Diff	G Level						
12			Freq	Dly Time	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed			
13			Freq	Dly Time	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed			
14			Freq	Dly Time	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed			
15			Freq	Dly Time	G Type	G Decay	G Diff	G Level	P Mod %	P Speed				
16			Freq	Dly Time	G Type	G Decay	G Diff	G Level	P Mod %	P Speed				
17			Freq	Dly Time	G Type	G Decay	G Diff	G Level	P Mod %	P Speed				
18			Freq	T Type	# Taps	T Delay	T Level	R Type	R Decay	R Damp	R Posit	R Level		
19			Freq	T Type	# Taps	T Delay	T Level	R Type	R Decay	R Damp	R Posit	R Level		
20			Freq	T Type	# Taps	T Delay	T Level	R Type	R Decay	R Damp	R Posit	R Level		
21			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed
22			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed
23			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	R Type	R Decay	R Damp	R Posit	R Level	P Mod %	P Speed
24			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	G Type	G Decay	G Diff	G Level	P Mod %	P Speed	
25			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	G Type	G Decay	G Diff	G Level	P Mod %	P Speed	
26			Freq	Rg Type	Rg Regn	Rg Levl	RG Lev	G Type	G Decay	G Diff	G Level	P Mod %	P Speed	
27			Freq	St L Lnth	St R Lnth	St Regen	St Damp	St Level	F type	F Width	F Speed	F Regen		
28			Freq	St L Lnth	St R Lnth	St Regen	St Damp	St Level	F type	F Width	F Speed	F Regen		
29			Freq	St L Lnth	St R Lnth	St Regen	St Damp	St Level	C Type	C Width	C Speed	C Base		
30			Freq	St L Lnth	St R Lnth	St Regen	St Damp	St Level	P Mod %	P Speed				
31			Freq	St L Lnth	St R Lnth	St Regen	St Damp	St Level	P Mod %	P Speed				

Parm 0 is a Group Select, no matter which group currently selected
Parm 1 is an Effect Enabler, no matter which group currently selected:
bit 0 = 1st Effect
bit 1 = 2nd Effect
etc.

Abbreviations and Limits

Name	=	Min Val	Max Val
Freq	Equalizer Frequency	0	12
F Type	Flanger Type	0	2
F Width	Flanger Width	0	15
F Speed	Flanger Speed	0	15
F Regen	Flanger Revereration	0	12
C Type	Chorus Type	0	2
C Width	Chorus Width	0	15
C Speed	Chorus Speed	0	15
C Base	Chorus Base	0	66
X Type	Pitch Transpose Type	0	3
X Steps	Pitch Transpose Steps	0	24
X Fine	Pitch Transpose Fine	0	32
X Regen	Pitch Transpose Regeneration	0	12
X Level	Pitch Transpose Level	0	15
P Mod %	Panner Mod %	0	15
P Speed	Panner Speed	0	15
Delay	Mono DDL Delay Time	0	**
R Type	Reverb Type	*	13
R Decay	Reverb Decay	1	47
R Damp	Reverb Damping	0	7
R Posit	Reverb Position	0	6
R Level	Reverb Level	0	15
R Diff	Reverb Diffusion (# 3 only)	0	3
G Type	Gate Verb Type	0	4
G Decay	Gate Verb Decay	0	***
G Diff	Gate Verb Diffusion	1	3
G Level	Gate Verb Level	0	15
T Type	Tapped DDL Type	0	17
# of Taps	Tapped DDL # of Taps	1	7
T Delay	Tapped DDL Delay	0	****
T Level	Tapped DDL Level	0	15
RG Delay	Regen DDL Delay	0	*****
RG Regen	Regen DDL Regeration	0	15
RG Level	Regen DDL Level	0	15
St L Lnth	Stereo DDL L Length	0	******
St R Lnth	Stereo DDL R Length	0	******
St Regen	Stereo DDL Regeration	0	15
St Damp	Stereo Damping	0	15
St Level	Stereo Level	0	15

* = 1 for Reverb 3, =5 for Reverb 2, = 9 for Reverb 1
** = 20 for Mono-DDL-S, = 48 for Mono-DDL-L
*** = 4 for G Verb 1, = 7 for G Verb 2 and 3
**** = 20 for Tap DDL-S, = 48 for Tap DDL-L
***** = 20 for Regen DDL-S, = 48 for Regen DDL-L
****** = 72 for Streo-DDL-S, = 100 for Streo-DDL-L

Appendix

Appendix C Hex to Decimal Conversion Table

Numbers are entered into FaderMaster in ordinary decimal form. However, you may need to look up the number for a command in the MIDI Implementation Chart of some device that you intend to control. The MIDI Implementation Charts in the owners manuals of some instruments may be written in "hexadecimal" (base 16) notation. Use this table to convert hexadecimal notation into decimal notation. (Remember that hex numbers are usually written preceded by a dollar sign, or followed by an "h", as in $7F or 7Fh.)

Hex	Decimal	Hex	Decimal	Hex	Decimal
00h	0	2Bh	43	56h	86
01h	1	2Ch	44	57h	87
02h	2	2Dh	45	58h	88
03h	3	2Eh	46	59h	89
04h	4	2Fh	47	5Ah	90
05h	5	30h	48	5Bh	91
06h	6	31h	49	5Ch	92
07h	7	32h	50	5Dh	93
08h	8	33h	51	5Eh	94
09h	9	34h	52	5Fh	95
0Ah	10	35h	53	60h	96
0Bh	11	36h	54	61h	97
0Ch	12	37h	55	62h	98
0Dh	13	38h	56	63h	99
0Eh	14	39h	57	64h	100
0Fh	15	3Ah	58	65h	101
10h	16	3Bh	59	66h	102
11h	17	3Ch	60	67h	103
12h	18	3Dh	61	68h	104
13h	19	3Eh	62	69h	105
14h	20	3Fh	63	6Ah	106
15h	21	40h	64	6Bh	107
16h	22	41h	65	6Ch	108
17h	23	42h	66	6Dh	109
18h	24	43h	67	6Eh	110
19h	25	44h	68	6Fh	111
1Ah	26	45h	69	70h	112
1Bh	27	46h	70	71h	113
1Ch	28	47h	71	72h	114
1Dh	29	48h	72	73h	115
1Eh	30	49h	73	74h	116
1Fh	31	4Ah	74	75h	117
20h	32	4Bh	75	76h	118
21h	33	4Ch	76	77h	119
22h	34	4Dh	77	78h	120
23h	35	4Eh	78	79h	121
24h	36	4Fh	79	7Ah	122
25h	37	50h	80	7Bh	123
26h	38	51h	81	7Ch	124
27h	39	52h	82	7Dh	125
28h	40	53h	83	7Eh	126
29h	41	54h	84	7Fh	127
2Ah	42	55h	85		

Appendix

Appendix D Registered Controller Numbers

The following list shows the standard Continuous Controller Functions, as defined in the MIDI 1.0 Detailed Specification.

You can use FaderMaster to send any of these commands, assuming of course that the instrument you are controlling can respond to these commands.

The fader would first be set to send Continuous Controller commands. The Parameter number is given in the table below.

0	Undefined
1	Modulation wheel or lever
2	Breath Controller
3	Undefined
4	Foot Controller
5	Portamento Time
6	Data entry, Most Significant Byte
7	Main Volume
8	Balance
9	Undefined
10	Pan
11	Expression Controller
12-15	Undefined
16-19	General Purpose Controllers
20-31	Undefined
32-63	Least Significant Byte for 0-31
64	Damper Pedal (Sustain)
65	Portamento
66	Sostenuto
67	Soft pedal
68	Undefined
69	Hold 2
70-79	Undefined
80-83	General Purpose Controllers
84-91	Undefined
92	Tremolo Depth
93	Chorus Depth
94	Celeste (Detune) Depth
95	Phaser Depth
96	Data increment
97	Data decrement
98	Non-Registered Parameter Number LSB
99	Non-Registered Parameter Number MSB
100	Registered Parameter Number LSB
101	Registered Parameter Number MSB
102-120	Undefined
121-127	Reserved for Channel Mode Messages

Appendix

Appendix E FaderMaster Program Disk

The FaderMaster Program Disk allows the User Bank programs (U1 through U9) and the Programmable Sysex Bank (P1) to be entered, edited, and stored on a computer. Alternately, the contents of FaderMaster's User Bank and Sysex Bank can be uploaded into the computer for more convenient display and storage.

In most situations, this program can be run as a "desk accessory" at the same time as another program. That would allow you to access FaderMaster's memory without having to quit a sequencer, for example.

The disk is not copy protected. We encourage you to make a back-up copy right away and to put the original in a safe place.

To use this software, first hook up a pair of MIDI cables from FaderMaster to your computer, either directly or via a MIDI switchbox.

Macintosh Users Please Note

There are two files on your disk, an application (stand alone program) and a desk accessory (briefcase file).

To use the DA version, first install it onto your system using the FONT/DA Mover program that came with your Macintosh. After quitting the FONT/DA Mover, verify successful installation by clicking on the apple icon and noting that FaderMaster now appears in your list of available desk accessories.

You may chose not to use the DA. There may exist certain applications that can not handle a MIDI-related DA, or perhaps you do not have room in your system for one more DA. In that case, ignore the DA and double click on the FaderMaster icon to launch the application.

MIDI Port Configuration (Macintosh)

As with all MIDI-related software, you need to tell the Mac which serial ports your MIDI interface is using.

Application

Selecting **Midi Port** from the File menu opens a dialogue box to allow you to select either the Modem or Printer Port, and the clock rate for your interface.

Desk Accessory (Macintosh)
The method of port configuration is slightly different for the DA. Selecting **Midi Port** from the FaderMaster menu opens two dialogue boxes in succession. The first box asks you which port the FaderMaster is connected to. Select Modem or Printer and click OK.

The second dialogue box enables the computer to sort out serial data. If the concurrently running application uses MIDI, and FaderMaster is hooked up to the same port as the application, click OK. That is, say that you are running a sequencer program, and the sequencer is set to record and play data through the Printer port. If FaderMaster is also hooked up to the Printer port, click OK.

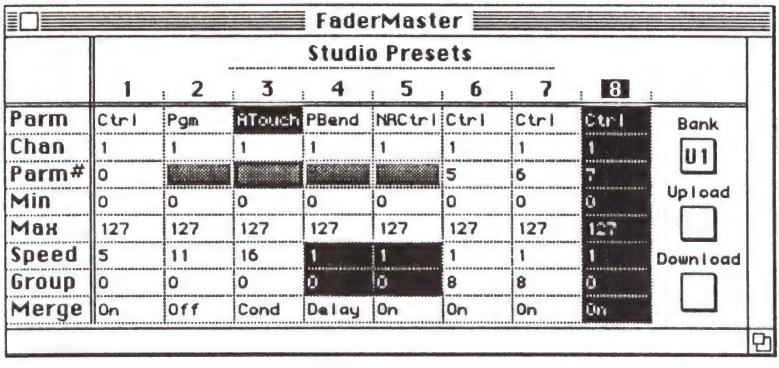
If the concurrently running application uses MIDI, but the application is not using the same MIDI ports as FaderMaster, select the clock rate of your interface and click Configure.

If the concurrently running application does not use MIDI, select the clock rate of your interface and click Configure.

Atari Users Please Note
There are several files on your disk. The DA version is already "installed" and can be accessed by selecting the Desk menu. Double click on the .PRG file to use the application.

A warning about desk accessories and the Atari! A DA certainly adds convenience in that it allows you to access the FaderMaster program without having to quit a sequencing program. But certain applications cannot deal with MIDI-related DAs. This is because many programmers in the Atari world "bend the rules" with regards to DA management. If the program you are running cannot handle a MIDI-related DA, it may actually damage existing files and cause the program to "crash". This, of course, would in no way harm the computer, but it could conceivably wipe out a sequence. So whenever possible, chose the **application**, and only use the DA if necessary, proceeding cautiously. Back up your files frequently.

Before using the DA with another program, first copy it onto your program disk. Be sure to copy both the .ACC and the .RSC files, otherwise you will get a "GEM error". Verify successful installation by clicking on the Desk menu and noting that FaderMaster now appears in the list of available desk accessories.


FaderMaster
Studio Presets
1 2 3 4 5 6 7 8
Parm Ctrl Pgm ATouch PBend NRCtrl Ctrl Ctrl Ctrl
Chan 1 1 1 1 1 1 1 1
Parm# 0 5 6 7
Min 0 0 0 0 0 0 0 0
Max 127 127 127 127 127 127 127 127
Speed 5 11 16 1 1 1 1 1
Group 0 0 0 0 0 8 8 0
Merge On Off Cond Delay On On On On
Bank
U1
Upload
Download

The Window

The numbers one through eight along the top refer to faders one through eight. You may click on the line above the numbers and type in a name for your setup. Hit Return to lock it in. Each program (U1-U9 and P1) can have a different name.

Select the program number by clicking on the box below the word "Program" to increment the number. On the Mac, holding **Option** while clicking decrements the number. On the Atari, holding **Alternate** while clicking decrements the number.

To select the parameter for a given fader, simply click on the parameter's name under the fader number. Continue to click until the desired parameter is displayed.

Parameter numbers and Fader Attributes are simply selected and typed in. Hit Return to lock them in. To select Merge or Delay Status, click on the Merge box for the intended fader. Continue to click until the desired Merge or Delay status is displayed.

Programmable Sysex Bank
The P1 bank permits MIDI System Exclusive messages to be sent by FaderMaster. The message may be up to 15 bytes long, and must be entered in Hexadecimal notation. The first and last bytes must be **F0** and **F7**, respectively. (These have already been provided in the Sysex Header.) Somewhere in your data stream you must type in a **vv**. This will be the value that corresponds to the position of the fader. You may also insert a Parameter number into the Sysex Header, if you wish. The Parameter number can then be set for each fader. If the equipment that you are trying to control requires the insertion of "checksum" bytes, you must be sure to include two such bytes in the Sysex Header.

Upload
Clicking on Upload brings FaderMaster's User Bank and Sysex Bank data into the computer for display, modification, or possible storage.

Download
Clicking on Download sends all User Bank and Sysex Bank data from the computer into FaderMaster's battery-backed memory. This will completely overwrite all User and Sysex programs in FaderMaster.

Shortcuts
Several utilities are available to speed data entry and editing.

The **Tab** key facilitates entry of data along a row by moving the cursor to the next item to the left, and then proceeding to the next row down.
Shift Tab moves the cursor to the right.

The up, down, left, and right **arrows** move the cursor in any direction.

Parameters and Attributes can be **Copied** and **Pasted** onto other faders, or other programs in the same bank. Any combination of Parameters and Attributes can be copied and pasted onto a different program in the User Bank. Any column (that is, the setup for one fader) can be copied and pasted on to other faders in the same program. Any column in P1 can be copied and pasted onto any other column in P1.

On the Mac or Atari Application, Copy, Paste, Clear, and Select All are selected from the Edit menu. On the **Mac DA**, these functions are selected from the "FaderMaster" Menu. On the **Atari DA**, a second dialogue box is used for these functions. Click on "File/Edit" to call up this dialogue box.

Selecting prior to Copy and Paste

(1) To select a whole column of data for one fader, click on the fader number.
(2) To select any region for copying, simply click and drag the mouse. Dragging the + cursor highlights the region.
(3) To add more highlighted boxes onto an already highlighted region, hold Shift, and while holding click and drag the mouse.
(4) To de-select a region on the Mac, hold the **Command** key, click and drag the + cursor over the region.

To de-select a region on the Atari, hold the **Control** key, click and drag the + cursor over the region.

It is also possible to enter a new Parameter or Attribute value, without automatically de-selecting a region for copying. On the Mac, hold the **Option** key while clicking on the box where you intend to enter a new value. On the Atari, the **Alternate** key is used.

Saving to Disk and Loading from Disk
The FaderMaster program acts as a MIDI "librarian" for FaderMaster, allowing you to save multiple User and Sysex Banks to disk. You may also load in previously saved files for modification and/or downloading into FaderMaster.

On the **Mac DA**, these functions are accessed through the "FaderMaster" Menu. On the **Atari DA**, a second dialogue box is used for these functions. Click on "File/Edit" to call up this dialogue box.

Save Program saves the one currently displayed program to disk.

Load Program loads a file containing a single program into the currently selected program number.

Load All and **Save All** simultaneously loads or saves programs U1 through U9 and P1 as a single file.